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Predicting Length of Stay and Outcome in Long-Term Residential Treatment of Male Alcoholics

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PREDICTING LENGTH OF STAY AND OUTCOME IN LONG-TERM RESIDENTIAL TREATMENT OF MALE ALCOHOLICS

by

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Robert D. Wadsworth

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ABSTRACT

Predicting Length of Stay and Outcome in Long-Term Residential Treatment of Male Alcoholics

by

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The purposes of this study were: (1) to determine which characteristics of male alcoholics are related to treatment success and length of stay in long-term treatment, and (2) to assess the efficacy of predicting outcome and length of stay on the basis of patient characteristics. The study was performed post hoc on 265 patients discharged from a 6- to 12-month residential alcoholism program on the grounds of a state hospital. After an extensive literature review, 19 predictor variables were selected which were most consistently related to outcome and length of stay in previous studies of shorter rehabilitation programs. Data for predictor variables were obtained from psychological testing, admission interview notes, anamneses, and symptom ratings. Treatment outcome at 6-month follow-up was assessed dichotomously (success - failure) and numerically (number of abstinence and social adjustment criteria met) based on questionnaire responses and second-hand information. Sample size varied across analyses, as cases were deleted for missing data.

Compared to patients who failed to benefit, treatment successes were less antisocial ($p < .01$) and reported fewer alcoholic withdrawal symptoms ($p < .05$, $n = 131$). The results also suggest that successes were less angry than failures (this variable reached significance in the analyses which were given the most consideration, and showed consistent trends in other analyses). Patient characteristics unrelated to treatment outcome were age, socioeconomic status, social stability, number of arrests, age at onset of drinking problem, problematic drinking by patients' parents, length of longest previous period of sobriety, number of previous alcoholism treatments, previous regular A.A. attendance, overall mental health, neuroticism, depression, obsessive compulsive traits, latent schizophrenia, IQ, and defensiveness. A four-variable discriminant function produced 70.23% correct classification of outcome ($r = .34$, $p < .01$, $n = 131$), but the 33.3% false negative rate raises a question about using the function as an acceptance criterion. The pattern of results implies that the long-term program fosters social integration, but does not overcome the effects of severe personality disorders or physical addictions.

Only IQ was related to length of stay, with more intelligent subjects remaining in treatment longer ($p < .05$, $n = 233$). Weak but statistically significant prediction of length of stay was obtained with a nine-variable regression equation ($r = .34$, $p < .01$, $n = 199$).

(243 pages)

INTRODUCTION

General Statement of the Problem

Clinicians in most of the helping professions operate under the assumption that some patients come to treatment with inherently better prognoses than other patients. With both physical and emotional anomalies, the extent to which a given patient is expected to respond to treatment is thought to be a function of the type and severity of his disorder and his resources in other areas. Not surprisingly, this belief is held by professionals whose function it is to study and treat the disorder or group of disorders known as alcoholism. For example, Trice, Roman, and Belasco (1969) claim, "Patients bring to treatment a set of characteristics which comprises a predisposition for success or failure" (p. 308).

Prognostic differences among patients assume particular significance in the management and understanding of alcoholics because many experts believe patient characteristics to be more important determinants of rehabilitation outcome than the characteristics of the treatment itself. Gibbins and Armstrong (1957) conclude, "It may be that when alcoholics are sufficiently motivated to seek treatment, within certain gross limits the specific nature and duration of the treatment they are exposed to is of less importance so far as response is concerned than the personal and social characteristics that they bring with them" (p. 447). Baekeland (1977, p. 391) suggests that the credit for treatment success among alcoholics should rest with the patients. Both Rae (1972) and McCance and McCance (1969) found that although

treatment outcome was related to certain client characteristics, it was not affected by the types of treatment to which the clients were exposed. In a multiple regression study, Bromet, Moos, Bliss, and Wuthman (1977) could explain 15 to 33% of the variance in treatment outcome on the basis of patient characteristics, but could only account for 1.5 to 3.8% of the variance on the basis of program characteristics. It is noted that by reanalyzing these data using a path analysis model, Cronkite and Moos (1978) found a stronger effect due to program characteristics. Nevertheless, the predominant sentiment in the alcoholism literature is that the characteristics which patients bring to treatment are far more powerful determinants of outcome that are aspects of the treatment program. To the extent that this is true, it should be possible to account for much of the variance in alcoholism treatment success among patients in terms of patient characteristics which are measurable at the onset of treatment.

With this information as background, the general purposes of this study were: (1) to identify those demographic, social history, drinking history, and personality characteristics of male chronic alcoholics entering a long-term treatment program which predict length of stay in treatment and successful treatment outcome, (2) to determine how much of the variances in treatment outcome and length of stay in treatment are accounted for by combining these variables, and (3) to develop formulae for predicting length of stay in the program and treatment outcome on the basis of these variables.

Rationale

Studies such as the present one have practical value in that they aid in clinical selection. When the number of alcoholics requiring treatment exceeds the capacity of treatment facilities, it is important that the patients who are selected for treatment are those who are most likely to benefit, so that treatment resources are utilized efficiently (Gibbs & Flanagan, 1977; Vallance, 1965). In addition, treatment facilities have an interest in selecting patients for admission who are likely to remain in treatment for the prescribed length of time over patients who are likely to terminate treatment early against medical advice. In this way, therapeutic efforts will not be wasted on poorly motivated patients (Miller, Pokorny, & Hanson, 1968). Many alcoholism rehabilitation programs already employ selection procedures, but these procedures tend to be based on poorly specified clinical criteria. Research findings regarding significant predictor variables can increase the precision with which practitioners select patients to undergo treatment who have favorable prognoses and who are unlikely to elope from treatment.

At a more theoretical level, research into the characteristics of alcoholics who do and do not benefit from treatment can contribute useful information toward establishing subclassifications of the disorder known as "alcoholism," given that differences in outcome depend more on patient than treatment characteristics (Gibbs & Flanagan, 1977). In addition, if treatment success is viewed as a function of the congruence between patients' prognostic predispositions and the demands made on patients by the treatment setting, then insights into patients' prognostic predispositions can lead to inferences about the emotional demands

imposed by the treatment program (Trice et al., 1969). Finally, the identification of prognostic predictors makes two contributions to research methodology. First, when random assignment to treatment conditions is not possible, knowledge about the inherent prognostic characteristics of one's subjects permits quasi-experimental control of subject differences across groups. Second, such knowledge allows the reader of evaluation research to interpret differences in outcome between various treatments on the basis of subject characteristics (Bromet et al., 1977; Gibbs & Flanagan, 1977).

Although there appears to be ample justification for performing studies of prediction of treatment outcome among alcoholics, well over 100 such studies have already been reported in the literature, and one must ask what one more study can add to this massive body of data. This study makes an important contribution as a result of the unusual length of the treatment program involved. The vast majority of inpatient rehabilitation programs reported in the prediction literature are of relatively short duration, ranging from 2 weeks to 3 months. Exceptions to this have either been halfway houses (Orford, 1974), psychiatric hospitals without separate alcoholism units (Harper & Hickson, 1951; Selzer & Holloway, 1957; Willems, Letemendia, & Arroyave, 1973), or programs which are longer than the standard 1 to 3 months but still shorter than the program studied here (Fitzgerald, Pasewark, & Tanner, 1967; Willems et al., 1973). The alcoholism treatment program at Norristown (Pennsylvania) State Hospital which is studied here, called "Independence House," is 6 to 12 months in length, and is designed to serve chronic "revolving door" alcoholics (that is, those who have failed to benefit from previous short-term treatment experiences) (Wieman, Bechtel, &

Sheehan, Note 1). Identification of predictors of success in this program and comparison of these predictors with those applying to shorter programs provides information about the types of patients who respond best to long-term (as opposed to short-term) programs. Because treatment in a long-term program (such as Independence House) is extremely expensive from the standpoint of staff time, more efficient utilization of treatment resources could result from information about the types of alcoholics who require and benefit from such a program.

Finally, much of the research in this area has been indiscriminate in the selection of independent variables. As a result, state of the art knowledge does not fit together into a coherent picture and the value of many predictor variables is equivocal. Often, authors have reported only those predictor variables which they found to be significantly related to outcome, without stating which variables were tested but not found to be significant predictors. This renders the reader powerless to ascertain which results may have been chance findings. It has been suggested that additional empirical research in this area is pointless, and that investigators must now attempt to make sense out of the information which is available (Bromet et al., 1977). The present study would seem to be a step in that direction, as predictor variables are selected on the basis of an extensive literature review.

Definition and Explanation of Terms

Alcoholic. A pragmatic definition of this term, similar to that stated by Gerard and Saenger (1966) is employed in this study. An alcoholic is an individual who seemingly has a problem related to the

use of alcoholic beverages which leads him/her to the attention of a treatment program.

Alcoholism. "A disorder manifested by complete absorbtion with and loss of control over consumption of alcohol and characterized by chronicity, intoxication, and tendency toward relapse" (Taber, 1977, p. A-52).

Completion of program. Many alcoholism rehabilitation facilities define the length of their treatment programs (for example, 30 days, 60 days, or 6 months). Completion of a program occurs when an individual remains in a treatment program for the recommended period of time. Such an individual is called a program "completer." An individual who does not stay in treatment for the full duration of the program and leaves against medical advice is a program "dropout."

Criterion variable. The dependent variable in a multiple regression analysis or a discriminant analysis.

Length of stay. Patients generally enter alcoholism treatment programs on a voluntary basis, and are therefore legally free to leave the programs and terminate treatment at any time they choose. Although many alcoholism treatment facilities define the length of their programs, a substantial proportion of patients leave treatment prior to program completion. A patient's length of stay is the period of time between his admission to a program and his termination of treatment, whether or not he completes the program.

Length of treatment involvement. This phrase encompasses completion versus dropping out of treatment programs, length of stay in treatment, and/or number of clinic contacts or number of therapy sessions attended.

Outcome. An alcoholic's adjustment following his involvement in a treatment program. Some researchers assess posttreatment adjustment solely in terms of drinking behavior; others also assess adjustment in areas such as employment, criminal behavior, and interpersonal relationships.

Predictor. A variable, measured when patients begin a treatment program, which is significantly related to their subsequent posttreatment adjustment and/or their length of stay in the program.

Predictor variable. An independent variable in a multiple regression analysis or a discriminant function analysis.

Treatment program. Any rehabilitation program, either inpatient or outpatient, the goal of which is to produce lasting changes in patients' addictive behaviors. As used here, the term does not refer to mere detoxification experiences without additional forms of therapy.

Treatment success/failure. An alcoholic is a treatment success if his posttreatment adjustment is consistent with the goals established by the treatment agency. For example, if the goal of a treatment program is to produce abstinence from alcohol, then an individual who remains abstinent after his treatment experience is a "success." An alcoholic whose posttreatment adjustment does not meet the goals of treatment is a treatment "failure."

LITERATURE REVIEW AND HYPOTHESES

Overview

In the prototypal research study investigating the prediction of alcoholism treatment outcome (or length of stay in treatment), independent variables have been selected haphazardly, without regard to the results of previous studies. Researchers have generally analyzed the relationships between all possible predictor variables at their disposal and some measure(s) of treatment outcome, to determine which predictors correlate significantly with outcome. As a result of this scattered, atheoretical approach, a massive but unorganized body of data has accumulated. An initial goal in this study was to derive hypotheses from the findings of previous studies. More specifically, the goal was to select for study here those predictor variables which have proven most powerful in previous research, and to replicate their efficacy in the setting of a longer term treatment program. The purpose of the literature review was to identify the predictor variables which have been found to be most consistently associated with positive treatment outcome and long stay in treatment.

Deriving the most consistent predictor variables from a large body of unorganized data is a formidable task. Over 100 research studies on this topic were reviewed in the search for stable predictors, and 95 studies were judged to be of sufficient significance and relevance to be reported here. Nearly all of the 95 articles reported the results of multivariate research. This body of knowledge therefore is comprised

of well over a thousand isolated bits of data. A full narrative review of all of these data would be prohibitively lengthy, nearly uninterpretable, and overwhelming to the reader. To overcome this problem, a tabular format is used to present the literature in its full bredth and scope and to provide the reader with a rationale for the designation of certain predictor variables as being "most stable" or "most consistent." Additionally, the tabular presentations are supplimented with a narrative review of the features of the literature which are most relevant to this study.

The body of this literature review, then, will assume the following format. First, the findings of previous researchers on predictors of alcoholism treatment outcome are presented comprehensively in two tables. The first table is arranged by author. The author(s) of each study is presented along with essential characteristics of the study, a list of significant predictor variables, and a list of nonsignificant predictor variables. The second table reorganizes the information contained in the first table by summarizing the findings relevant to each predictor variable which has been investigated. In the second major section of this review, two corresponding tables are used to present the previous findings on predictors of length of stay in treatment. In the third section, the derivation of the nineteen most stable predictors in the literature is explained. A narrative account of the major research findings concerning each of the predictor variables ensues. Then, the literature is briefly summarized in a state-of-the-art section, and finally hypotheses and expectations are declared.

Predictors of Treatment Outcome

Explanation of Table 1. In Table 1, the results of 68 studies on the prediction of alcoholism treatment outcome are presented. The format of Table 1 is similar to the tabular format used by Gibbs and Flanagan (1977) in their review of 45 alcoholism treatment outcome prediction studies. The studies are ordered alphabetically by author's last name. In the first column of Table 1, ten characteristics of the studies are presented in an abbreviated format, in the following order:

(1) Author(s) last name(s).

(2) Year of publication, in parentheses.

(3) N_1/N_2: N_1 is the number of subjects used in the data analysis; N_2 is the total number of subjects potentially available to the authors for study. For example, if an author wanted to study 175 consecutive admissions to a treatment program, but because of missing data, subject attrition, sampling procedures, etc., only analyzed data on 102 of the subjects, the study would be coded "102/175."

(4) "$\bar{X}$age": The mean age of subjects in the study.

(5) Sex of the subjects: male only ("m"), female only ("f"), or both male and female ("m & f").

(6) Treatment setting: inpatient ("I") or outpatient ("O").

(7) Primary treatment modalities to which subjects were exposed, according to the following key:

a - Antabuse

A.A. - Alcoholics Anonymous meetings

b - Behavior therapy (conditioned reflex therapy, discrimination training, decisions about drinking)

d - Detoxification

g - Group psychotherapy

h - Halfway house

m - Other or unspecified medication

p - Individual psychotherapy

y - Hypnosis

(8) Outcome criteria (how improvement due to treatment or successful treatment outcome was measured), according to the following key:

Ab - Abstinence, amount of abstinence, degree of abstinence, change in alcohol intake.

Sa - Social adjustment (one or more of: employment record, marital status, marital stability, interpersonal relationships, social adjustment, financial adjustment, self-perception, personality change).

Rc - Recidivism, readmission for further treatment.

(9) Duration of follow-up interval: the average or approximate length of time from the point when the follow-up interval began (see below) to the time when the researcher(s) assessed the enduring effects of treatment.

(10) Onset of follow-up interval, in parentheses, coded as follows:

(A) - Follow-up interval was defined as starting when subjects were admitted to or began treatment (common for outpatient treatment).

(D) - Follow-up interval was defined as starting when subjects were discharged from, left, or completed treatment (common for inpatient treatment).

(starting ?) - Time of onset of follow-up interval not specified.

A "?" entry for any characteristic means that aspect of the study was not adequately specified.

For each study listed in Table 1, the variables which were found to be predictive of successful treatment outcome are presented in the second column. These variables are worded such that an individual possessing more of the characteristic as stated is more likely to be abstinent and/or better adjusted after treatment than an individual possessing less of the characteristic. In most cases, the relationships between the successful predictive variables and indices of treatment outcome reached at least the .05 level of statistical significance. In a few instances, however, relationships between the predictors and outcome were statistically nonsignificant but (in the authors' opinions) practically significant trends. Also in a few studies, formal statistical analyses were not performed, and predictors were judged "significant" by inspecting frequency or percentage tables. Occasionally, authors indicated that certain variables bore stronger relationships with outcome than others or reached higher significance levels. In these instances, variables in the second column of Table 1 are numbered in rank order, with lower numbers signifying stronger predictive power.

Finally, in the third column of Table 1 are listed, for each study, those intake variables which bore no relationship to treatment outcome. It should be noted that in general, authors were less meticulous in reporting nonpredictors than significant predictors, so column 3 is probably incomplete in conveying all findings of variables having no predictive value.

Explanation of Table 2. In order to give the reader a sense of the strength of the various predictor variables, the data of Table 1

Table 1

Results of Previous Research on

Predictors of Treatment Outcome

Author(s) and Characteristics of Study	Successful Predictors	Nonpredictors
Adamson, Fostakowsky, & Chebib (1974): 38/52; $\bar{X}$age=43; m; I; A.A., m; Ab; 1 yr. (starting?).	Favorable view of self and others Education Residential stability	Mood checklist factors: Dysphoria Angry potency Angry withdrawal Social competence Age Race Family status Socioeconomic status Work record Religion Residence Drinking history Legal involvement Anomy
Aharan, Ogilvie, & Partington (1967): 72/116; $\bar{X}$age=38.5; m & f; O; p, g, a; Ab & Sa; 6-18 mos.(A).	(None)	Employment Marital status Economic status Self-perception Age Sex Education Religion Drinking history Motivation (willingness to take antabuse, sobriety at clinic visits, voluntary referral)
Baekeland, Lundwall, Kissin, & Shanahan (1971): 232/?; $\bar{X}$age=?; sex?; O; a; Ab; 6 mos.(A).	Older age Long history of heavy drinking D.T.'s in history Previous A.A. contact Sober at admission Less depressed Socially stable (living with someone, employed)	Education Income Hallucinations in history History of hospitalizations Suicide attempts Assaultiveness Arrests

Table 1 (continued)

Author(s) and Characteristics of Study	Successful Predictors	Nonpredictors
Bateman & Petersen (1971): 381/521 (program completers only); $\bar{X}$age=46.2; sex?; I; g, m, A.A., p; Ab; 6 mos.(D).	Age 45 or older 1 week or more abstinence before admission Previous regular A.A. attendance Mother deceased If mother living, little contact with her	Marital status No. of children Spouse's attitude toward patient's drinking Religion Church membership Frequency of church attendance No. of close friends Drinking pattern Type of alcohol consumed Education Occupation Socioeconomic status Memberships IQ Daily alcohol consumption Age at first drink Phase of alcoholism Age of onset Duration of problem
Bateman & Petersen (1972): 517/719 (program completers only); $\bar{X}$age=?; m & f; I; m, g; Ab; 6 mos.(D). (Data based on same sample as Bateman & Petersen, 1971)	Male (trend) Age 45 or older For males: 1 week or more abstinence before admission Previous regular A.A. attendance Mother deceased If mother living, little contact with her For females: Not high school graduate Low status occupation Employed High or low (not middle) social status	Marital status No. of children Spouse's attitude toward patient's drinking Spouse's drinking Religion Frequency of church attendance Church membership No. of close friends Drinking pattern Type of alcohol consumed Phase of alcoholism Age of onset Duration of addiction For males: Employed at admission Occupational level Social status

Table 1 (continued)

Author(s) and Characteristics of Study	Successful Predictors	Nonpredictors
Bateman & Petersen (1972) (continued)	For females (continued): Membership in 1 club or organization (no less, no more) High IQ High alcohol consumption Took first drink before age 20 1 week or more abstinence before admission (trend)	For males (continued): Membership in clubs and organizations IQ Alcohol consumption Age at first drink
Blaney, Radford, & MacKenzie (1975): 251/289; $\bar{X}$age=?; m & f; I; subpopulation 1 received d, g, a, A.A., subpopulation 2 received d; Ab; 6 mos. (starting?).	For rehab. program: Few previous psychiatric admissions Few previous admissions to other hospitals Religion (Presbyterian) No legal trouble For detox. only: No legal trouble Older age High or low (not middle) social class)	Sex Marital status Age at admission Type of admission Education Cigarette smoking Previous attempts to change
Bowen & Androes (1968): 71/79; $\bar{X}$age =45; sex?; I or O?; m; Ab & Sa; follow-up interval?	Married, not single or divorced	(Not reported)
Bradfer (1974): ?/?; $\bar{X}$age=?; sex?; I or O?; outcome criterion?; follow-up interval?	Older age High motivation Neurotic Not sociopathic	(Not reported)

Table 1 (continued)

Author(s) and Characteristics of Study	Successful Predictors	Nonpredictors
Bromet, Moos, Bliss, & Wuthman (1977): 373/429; $\bar{X}$age=?; m & f; I; 5 treatment facilities including h, b, m, a; Ab & Sa; 6-8 mos. (starting?).	Married High socioeconomic status Low physical impairment No previous hospitalizations	(Not reported)
Caster & Parsons (1977): ?/?; $\bar{X}$age=?; m; I; treatment?; Rc; 4-6 mos. (starting?).	Less depressed Less sociopathic (trend) If depressed, perceive control in powerful others, rather than in chance If sociopathic, don't perceive control in chance	Locus of control (no main effect)
Choi (1973): 100/?; sex?; O; p, m; Ab; 3-12 mos. (A).	Dream about drinking Age 50-59 White Married or single (not separated, widowed, or divorced) If dream about drinking: More education If do not dream about drinking: More hours sleep per night	(Not reported)
Cripe (1975): 325/505; $\bar{X}$age=?; m; I or O?; treatment?; outcome criterion?; 18 mos. (starting?).	Age Previous admissions to same facility Weeks worked in previous year Length of employment Previous alcoholism treatments	MMPI scales and code types

Table 1 (continued)

Author(s) and Characteristics of Study	Successful Predictors	Nonpredictors
Davies, Shepherd, & Myers (1956): 49/150 (excluded treatment rejectors); $\bar{X}$age=?; m & f; "mostly" I; p, a; Ab & Sa; 2 yrs. (starting?).	Married (not single or divorced) First admission Continuous (not intermittent) drinking (trend) Diagnosis of "simple alcoholism" No personality disorder Good work record and employed at admission Lack of criminal activity Socially stable	Age Nationality Type of beverage Diagnosis of "chronic alcoholism" IQ Referral source Duration of drinking problem Occupation Socioeconomic status
Edwards, Iorio, Berry, & Gunderson (1973): 58/142; $\bar{X}$age=32.9; m; I; treatment?; Sa; 3 yrs. (starting?). (Navy)	(1) More years of service (2) High pay grade (3) Older age (4) Completion of at least one service school (4) (tie) White (5) Worked as supervisor (6) No history of disciplinary trouble Father white collar or skilled worker	(Not reported)
Edwards (1966): ?/20; $\bar{X}$age=?; sex?; I; p, a, A.A., y for $\frac{1}{2}$ of subjects; Ab; 1 yr.(D).	(1) Socially stable (2) Less neurotic (trend) (3) Extraverted (trend)	IQ
Fitzgerald, Pasewark, & Tanner (1967): 450/450; $\bar{X}$age=43; m & f; I; treatment?; Rc; follow-up interval? (starting?).	For males, EPPS scales: (1) Change (2) Heterosexuality (3) Exhibition	Other EPPS scales

Table 1 (continued)

Author(s) and Characteristics of Study	Successful Predictors	Nonpredictors
Gerard & Saenger (1966): 600/800; $\bar{X}$age=?; m & f; O; treatment?; Ab; 1 yr. (A).	Older age (trend) Occupation housewife or service worker Socially stable Married Living with family Employed	Sex Education Race
Gertler, Raynes, & Harris (1973): 20/84; $\bar{X}$age=?; sex?; O; "broad-spectrum therapy"; Ab; 1 yr. (A).	Initial period of sobriety of at least 1 year	Ego strength Length of longest previous period of sobriety (Unspecified demographic and social variables)
Gibbins & Armstrong (1957): 69/102 who made subsequent outpatient contact, were inpatient for at least 6 days and outpatient for at least 3 visits, and were randomly selected; $\bar{X}$age=?; sex?; I & O; g, A.A.; Ab; 9-55 mos. (starting?).	Married Employed at admission Socially stable	Age Duration of excessive drinking
Gilles, Laverty, Smart, & Aharan (1974): 1263/1804; $\bar{X}$age=?; m & f; I & O; Ab; 12 mos. (A).	Older age (trend) More days abstinent in past year (trend) Socially stable (trend) Better work history (trend)	Type of drinking Alcohol consumption Marital stability Assessment of drinking Sex Marital status Occupation Employment status
Gillis & Keet (1969): 709/797; $\bar{X}$age=?; sex?; I; treatment?; Ab & Sa; up to 5 yrs., 80% for at least 3 yrs. (starting?).	High education High occupational level Little downward social movement Able to make and keep interpersonal relationships Motivated	Age Marital status Duration of drinking

Table 1 (continued)

Author(s) and Characteristics of Study	Successful Predictors	Nonpredictors
Gillis & Keet (1969) (continued)	Little denial Referred by doctor or self (not by welfare or A.A.) No previous psychiatric admissions Previous admissions to same facility Not psychotic Neurotic Depressive diagnosis Not psychopathic	
Glatt (1961): 94/?; $\bar{X}$age=?, m & f; I; g, A.A., m; Ab; follow-up interval? (starting?).	(1) Not psychopathic (2) Male Married and living with spouse High IQ For males: Age 51 or older	(Not reported)
Goldfried (1969): 105/163; $\bar{X}$age=?; m & f; O; treatment?; Ab & Sa; 4-8 mos. (starting?).	Amount of abstinence in year preceding treatment (positively predicted posttreatment abstinence, but negatively predicted overall improvement and change in abstinence, due to ceiling effect. Subjective prognostic estimate First admission Good employment history in past 3 yrs. Married or widowed High education Father high occupational level (trend) Female Subjective rating of motivation Subjective rating of likability	Social competency Birth order Drinking by parents Drinking by spouse

Table 1 (continued)

Author(s) and Characteristics of Study	Successful Predictors	Nonpredictors
Goodwin, Crane, & Guze (1971): 93/?; $\bar{X}$age=34; m; prison; treatment?; Ab; 8 yrs. (D).	White Older Age Roman Catholic or unaffiliated (not Protestant) Nonalcoholic father No relatives in prison	Severity of alcoholism Symptom pattern Sociopathic symptoms Neurotic symptoms Physical health Education
Gottheil, Murphy, Skoloda, & Corbett (1972): 25/29; $\bar{X}$age= 40.8; m; I; b; Ab; follow-up interval? (starting?).	(None)	Age Education Marital status Drinking history Occupational level Highest annual earnings Last year's earnings No. mos. work missed in last year Situational discomfort Sleep discomfort Self-esteem
Haberman (1966): 85/96 who attended at least 4 sessions; $\bar{X}$age=42; m & f; O; g; Ab; less than 26 wks. (starting?).	(1) Amount of sobriety in past 2 yrs. No college education Lower occupational level (Latter 2 variables may be due to artifact of this population) Prior A.A. attendance No previous psycho-therapy	Age Sex Marital status Employment status
Harper & Hickson (1951): 80/84; $\bar{X}$age=?; sex?; I; d, p; Ab; 2-5 yrs. (starting?).	Cyclothymic personality Syntonic personality Not psychopathic	Sex Age Duration of alcoholism
Hedberg, Campbell, Weeks, & Powell (1975): 28/?; $\bar{X}$age=38.2; m; O; b; Ab; 6 mos. (A).	MMPI Mini-Mult: Greater overall pathology Lower L Higher Pa Higher Pt (trend) Lower Pd	Other MMPI scales

Table 1 (continued)

Author(s) and Characteristics of Study	Successful Predictors	Nonpredictors
Heilbrun (1971): 120 (initial) & 335 (cross-validation)/?; $\bar{X}$age=42.1; m & f; O; a, g, p, h; global rating of improvement, follow-up interval = 0.	High education Higher IQ Low Sc (MMPI) Low Ma (MMPI)	Sex Race Marital status Other MMPI scales Memory-for-Designs test
Hoffman & Jansen (1973): 251/?; $\bar{X}$age=44.9; m; I; treatment?; outcome criterion?; follow-up interval? (starting?).	High improvement: Low L (MMPI) Moderate improvement: Highest L (MMPI) High or low improvement: Higher Pd (MMPI) than moderate or minimal improvement	Other MMPI scales
Kish & Hermann (1971): 168/173 (program completers only); $\bar{X}$age=42; m; I; A.A., g; Ab & Sa; 1 yr. (starting?).	Married (assessed at follow-up)	Commitment status Age Education Vocational interests Intelligence Aptitudes MMPI scales
Kissin, Platz, & Su (1970): 50% of ? (program completers only); $\bar{X}$age=?; m; 3 treatment groups: (1) O; m; (2) O; g, m; (3) I; treatment?; Ab & Sa; 1 yr. (starting?).	For medication: High social competence Low nonverbal IQ Field dependent (i.e. socially intact, psychologically unsophisticated) For group psychotherapy: High social competence High verbal IQ High nonverbal IQ Field independent (i.e. socially and psychologically stable)	(Not clearly reported)

Table 1 (continued)

Author(s) and Characteristics of Study	Successful Predictors	Nonpredictors
Kissin, Platz, & Su (1970) (continued)	For inpatient rehab. unit: Low social competence High nonverbal IQ Field independent (i.e. socially unstable, intellectually sophisticated)	
Kissin, Rosenblatt, & Machover (1968): 225/480; $\bar{X}$age=?; m; 3 treatment groups: (1) I; (2) O; (3) O; treatments?; Ab & Sa; follow-up interval? (starting?).	Age 45 or older White Protestant Some college Steady job Periodic drinking Self-referred Fantasy ideation (Rorschach) Active (WAIS) WAIS subtests: Vocabulary Picture completion Digit span Arithmetic Comprehension Field independence (trend) (Summary: Social competence means good prognosis)	Marital status Occupation No. of arrests Place of drinking A.A. affiliation
Kolb & Gunderson (Note 2): ?/?; $\bar{X}$age=?; m; I; treatment?; outcome criterion?; follow-up interval? (starting?). (Navy)	Pay grade Prognostic rating by treatment staff (Others not specified)	(Not reported)

Table 1 (continued)

Author(s) and Characteristics of Study	Successful Predictors	Nonpredictors
Kurland (1968): 219/378; $\bar{X}$age=?; m; I; g, A.A.; Ab & Sa; average 28.5 mos. (starting?). (Based on same data as Trice et al., 1969, and Trice & Roman, 1970)	Material (sic) status and living with wife First admission High residential adjustment High sobriety rating IQ at least 115	(Not reported)
Madden & Kenyon (1975); ?/98; $\bar{X}$age=?; m & f; O; g; Ab; 6-36 mos. (A).	Alcohol history of at least 16 yrs. Absence of convictions Lack of need for detoxification For males: High social stability	Sex Socioeconomic status Marital status Drinking pattern Age
Mayer & Myerson (1970): 222/595; $\bar{X}$age=40; sex?; O; treatment?; Ab; discharge or after 36 mos. (A).	For low socioeconomic status: High personal stability (marital status, employment, lack of physical deterioration, age 40 or older)	Drinking pattern Referral source Motivation
McCance & McCance (1969): 190/194 "with at least minimum necessary cooperation with treatment"; $\bar{X}$age=?; sex?; I; b, g; Ab & Sa; 6-12 mos. (starting?).	(1) If married, marriage stable Living with friend, relative, or spouse Steady job Drinks whiskey or beer (culturally accepted drinks) No police convictions No D.T.'s First admission for alcoholism High socioeconomic status Resides outside of city	(Not reported)

Table 1 (continued)

Author(s) and Characteristics of Study	Successful Predictors	Nonpredictors
McCance & McCance (1969) (continued)	Significant at 1 yr. but not 6 mos. follow-up: Bout or weekend binge drinking From subculture in which heavy drinking is uncommon	
Miller (1944): 487/513; $\bar{X}$age=?; sex?; O; treatment?; Ab; 2 mos. (starting?).	Periodic (not daily) drinker	(None reported)
Mindlin (1959): 112/?; $\bar{X}$age=?; m & f; O; treatment?; Ab & Sa; follow-up interval? (starting?).	Married and living with spouse Regular job or potential for one High status occupation Few arrests Motivated and willing to take responsibility and sacrifice High IQ Obsessive compulsive neurosis (not hysteria, schizophrenia, OBS, antisocial, or dyssocial) Rorschach measures of: Creative maturity Sensitivity Controlled interpersonal warmth Persistence Productivity and effort Independence and lack of suggestibility	Age Sex Religion Living arrangement Total past adjustment Education Recent occupation Recent regularity of work Physical problems Alcoholic reactions Original IQ Previous treatment Type of drinking Attitude toward interviewer Mood Self-esteem Self-confidence

Table 1 (continued)

Author(s) and Characteristics of Study	Successful Predictors	Nonpredictors
Mindlin (1960): 77/100; $\bar{X}$age=?; m; I; p, g; Ab & Sa; 3 mos. - 3 yrs. (starting?).	Black Having a home Good adjustment in past Superior IQ College education High status occupation Regular employment Spree or continuous (not both) drinking 11-25 arrests Positive prognostic rating based on Rorschach Good prognostic rating based on motivation, economic resources, and diagnosis Good prognostic rating at diagnostic conference Trends: Married Having personal ties Good economic resources Honorable discharge Previous period(s) of sobriety Diagnosis of anxiety, depressive, or obsessive compulsive neurosis (not dissociative neurosis) Not OBS Not sociopathic	Age Religion Sibling status Military status Severity of reaction to alcoholic bouts Previous efforts to obtain treatment
Muzekari (1965): 180/?; $\bar{X}$age=?; m; I; treatment?; Ab; 1 yr. (D).	14 MMPI items (trend)	MMPI scales "Healthy" vs. "Neurotic" in Leary's Interpersonal System of Personality

Table 1 (continued)

Author(s) and Characteristics of Study	Successful Predictors	Nonpredictors
Orford (1973): 36/100; $\bar{X}$age=?; m; O; p; Ab; 12 & 24 mos. (A). (Abstinent subjects excluded from analysis: interested in controlled vs. uncontrolled drinkers)	Less chronic Fewer symptoms (morning drinking, tremors, hallucinations, time lost from work) Fewer family consequences (trend) Don't think of selves as alcoholics or excessive drinkers Don't make unequivocal statements about goal of future abstinence	Age Legal history Hospitalization history
Orford, Oppenheimer, Egert, Hensman, & Guthrie (1976): 100/141; $\bar{X}$age=?; m; O; treatment?; Ab; 12 mos. (A).	High "marital cohesion" factor Low "expressed hostile dominance and failure to express affection" factor Wife's desirable descriptions of husband's sober periods Wife's affection Balance in family task participation High occupational status Little hardship on wife due to husband's drinking High self-esteem	(Not reported)
Pemberton (1967): 100/?; $\bar{X}$age=?; m & f; I; p; 8-24 mos. (mean 1¼ yrs.) (starting?).	For 50 females: Less than 4 admissions Married (trend) Not OBS (trend) Neurotic Introverted 16PF Anxious (trend)	For 50 females: Age Age of onset Years of addiction Husband's attitude Raven Progressive Matrices Test

Table 1 (continued)

Author(s) and Characteristics of Study	Successful Predictors	Nonpredictors
Pemberton (1967) (continued)	For 50 females (continued): 16PF Submissive (trend) For 50 males: More previous admissions Not OBS Neurotic High on Raven Progressive Matrices Test Less anxious (trend) Less introverted (trend)	For 50 females (continued): Mill Hill Vocabulary Test For 50 males: Age Age of onset Years of addiction Marital status
Pokorny, Miller, & Cleveland (1968): 88/206; $\bar{X}$age=43.5; m; I; g, A.A.; Ab; 1 yr. (starting?).	Better socialization Better handling of family and interpersonal problems More shy Lower self-esteem More passive Feel more persecuted Less drive Sought psychiatric treatment more often More seizures Rate selves as more mentally ill Less time in jail More job progress More realistic job plans Married and living with spouse Lower Ma (MMPI) (trend) Lower Pa (MMPI) (trend) Higher other MMPI scales (trend)	Age Education IQ Personality

Table 1 (continued)

Author(s) and Characteristics of Study	Successful Predictors	Nonpredictors
Pokorny et al. (1968) (continued)	Summary: Abstainers more neurotic Drinkers more psychopathic	
Pokorny, Miller, Kanas, & Valles (1971): 55/201; $\bar{X}$age=?; sex?; I; treatment?; outcome criterion?; follow-up interval? (starting?).	High on "marital-emotional disruption" factor Low on "social isolation" factor (trend)	Factors: Loss of control of drinking Socioeconomic status Personal dilapidation Duration of alcoholism Multiple hospitalizations Severity of alcoholism Aggressive-outgoing Elation Steady worker
Rae (1972): 58/62; $\bar{X}$age=?; m; I; treatment?; Ab; 2 yrs. (starting?).	Short duration of problem drinking Neurotic, not character disorder (trend) Wife less antisocial (MMPI Pd scale) MMPI "disturbed profile" Neither patient nor wife antisocial (MMPI Pd scale) Wife not working	Medical problems MMPI scales Wife's degree of disturbance (MMPI) Sexual disturbance Marital infidelity Age Length of marriage Length of addiction D.T.'s Hallucinosis
Rafaelson (1974): 50/? (program completers only); $\bar{X}$age=?; sex?; I; treatment?; 16 mos. (starting?).	Neurotic, without character defect Age 30-39 "Pure" and "subchronic" abuse	(None reported)
Rathod, Gregory, Blows, & Thomas (1966): 84/111 (program completers only); $\bar{X}$age=?; m; I; g; Ab & Sa; 2 yrs. (starting?).	Constructive and responsible Sincere Older age (especially if longer duration of drinking problem)	Length of drinking problem Heavy drinking in family Special position in family Unhappy childhood

Table 1 (continued)

Author(s) and Characteristics of Study	Successful Predictors	Nonpredictors
Rathod et al. (1966) (continued)	No history of anti-social behavior No premarital sexual promiscuity No infidelity No broken marriage Married (trend) No history of repeated homosexual practice	Length of employment Occupational level
Ritson (1968): 99/100; $\bar{X}$age=?; m & f; ½ O (p); ½ I (d, g) & O; Ab; 6 mos. (A to outpatient phase).	High social class Older age For outpatients: Loss of control (not inability to abstain) pattern Mild or moderate personality disorder Long history of addiction (from first withdrawal symptoms) Previous A.A. experience Abstinent for several days at start of treatment Good marriage For inpatients: Extant marriage No arrests for drunkenness or DWI Later age of onset (from first withdrawal symptoms) No suicide attempts	Sex Religion Referral source No. of siblings Position in sibship Parental drinking pattern Duration of excessive drinking (self-report) Type of drink preferred Blackouts or withdrawal symptoms Loss of jobs due to drinking History of drinking cheap wine or spirits Previous treatment Physical complaints
Ritson (1971): 100/?; $\bar{X}$age=?; sex?; ½ I (g); ½ O (p); Ab; 1 yr. (starting?).	Low hostility For outpatients: Spouse low hostility Neurosis or mild (not moderate or severe) character disorder	Self-criticalness For inpatients: Personality type

Table 1 (continued)

Author(s) and Characteristics of Study	Successful Predictors	Nonpredictors
Rossi, Stach, & Bradley (1963): 173/243; $\bar{X}$age= 44.2; m; I; g, A.A.; Ab; 21 mos. (D).	History of habitual symptomatic drinking IQ at least 81 No psychiatric history except alcoholism Diagnosis of functional psychosis in addition to alcoholism Admit to being alcoholic, but with reservations At least 7 mos. previous A.A. affiliation At least 6 mos. previous sobriety Longest previous abstinence resulted from A.A. and other treatment State that "maybe" will affiliate with A.A. later Attended church occasionally as adolescent (not too much or too little)	(Not reported)
Schmitt (1976): ?/643; $\bar{X}$age=?; m; I or O?; treatment?; Sa; outcome assessed at end of treatment.	Older age	(Not reported)
Selzer & Holloway (1957): 83/131 who were followed up; $\bar{X}$age=43; sex?; I; A.A.; Ab, Sa, & Rc; 5 yrs. (starting?).	Good work history Drinking began after age 25 Older age	Family support Previous A.A. contact No. of admissions Years of excessive drinking
Stanetti (1976): ?/?; $\bar{X}$age=?; sex?; I or O?; treatment?; outcome criterion?; follow-up interval? (starting?).	Neurosis Good marriage Good employment No parental deprivation in childhood and early adolescence	(Not reported)

Table 1 (continued)

Author(s) and Characteristics of Study	Successful Predictors	Nonpredictors
Stanetti (1976) (continued)	No personality disorder	
Thomas, Gliedman, Imber, Stone, & Freund (1959): ?/?; $\bar{X}$age=41; m & f; O; p, g; Ab & Sa; follow-up interval? (starting?).	Female (trend)	(Not reported)
Tomsovic (1970): 160/266 who were in program at least 30 days; $\bar{X}$age=43; sex?; I; g; Ab & Sa; 1 yr. (starting?).	Not sociopathic (MMPI code) (trend)	Amount and kind of previous treatment Length of drinking problem Schizophrenic
Tomsovic (1974): 93/179; $\bar{X}$age=?; sex?; I; treatment?; outcome criterion?; 3 mos. (D).	Less trouble with law For binge drinkers: High IQ Older age For continuous drinkers: Good employment record	Binge vs. continuous drinking
Trice, Roman, & Belasco (1969): 254/378; $\bar{X}$age=?; m; I; g, A.A.; Ab & Sa; 28.5 mos. (starting?).	Few or no arrests High occupational status Few or no previous state hospitalizations First or second generation parent Longer period of alcoholism First intoxication at a later age Small no. of siblings Exposure to alcoholism at place away from home Internally apprehensive of social interaction	Economic situation Exposure to alcoholism among family members Birth rank Childhood happiness General health Marital experiences and adjustment

Table 1 (continued)

Author(s) and Characteristics of Study	Successful Predictors	Nonpredictors
Trice et al. (1969) (continued)	Self-blaming, but presents to others as outgoing and happy Naive Sentimental Gregarious with simple tastes Socially unskilled Lacks insight Trusts accepted values Low MMPI Pd scale Rigid Suspicious Critical	
Vallance (1965): 57/68; $\bar{X}$age=44; m; I; no special treatment; Ab & Sa; at least 2 yrs. (starting?).	First admission Good previous personality Married and living with wife	Duration of problem
Vogler, Weissbach, & Compton (1977): ?/148; $\bar{X}$age=?; sex?; I, O; (1) b, (2) p; Ab & Sa; 12 mos. (starting?).	Pretreatment alcohol intake No. of hospitalizations No. of jobs lost due to alcohol Socioeconomic status Education Days per month lost to work due to alcohol Duration of drinking problem Age	16PF scales Locus of control CTMM scores
Wallerstein (1957): ?/?; $\bar{X}$age=?; m; I; (1) a, (2) b, (3) y, (4) g, p; Ab & Sa; 2 yrs. (starting?).	For antabuse: Passive aggressive Not latent schizophrenic Not inadequate personality Residentially stable (trend)	(Not reported)

Table 1 (continued)

Author(s) and Characteristics of Study	Successful Predictors	Nonpredictors
Wallerstein (1957) (continued)	For antabuse (continued):	
	Age older than 37 (trend)	
	Compulsive character	
	Not depressed	
	For conditioned reflex:	(Not reported)
	Schizophrenic	
	Schizoid	
	Passive-dependent	
	Neurotic	
	Not aggressive	
	Not paranoid	
	Not antisocial	
	Not inadequate	
	Not passive aggressive	
	For hypnotherapy:	(Not reported)
	Passive dependent	
	Not schizoid	
	Not schizophrenic	
	For milieu therapy:	(Not reported)
	Married	
	Regular work history	
	Non-promiscuous sex life	
Willems, Letemendia, & Arroyave (1973): 62/69; $\bar{X}$age=?; m; I; d, g, a, A.A.; Ab; 1 & 2 yrs. (starting?).	Not living in isolation	(Not reported)
	Good work record	
	Good legal record	
	No history of D.T.'s	
	High socioeconomic	
Williams (1977): 60/159; $\bar{X}$age=?; sex?; I; g; Ab; 1 yr. (starting?).	High social stability	(Not reported)
Wolff & Holland (1964): 229/364; $\bar{X}$age=?; m & f; I; g, a; Ab & Rc; follow-up interval "varied" (starting?). (South Africa)	Age at least 45	Sex
	Married (trend)	Employment status
	Maintained a household	Occupational class
	Not member of Dutch Reformed church	

Table 1 (continued)

Author(s) and Characteristics of Study	Successful Predictors	Nonpredictors
Zimberg (1974): 83/113; $\bar{X}$age=?; sex?; 0; (1) d, p, (2) "broad spectrum therapy"; Ab; 1 yr. (A). (Subjects low socioeconomic in Harlem)	Married Not on welfare Not living in social isolation Higher socioeconomic status Less impaired in vocational functioning Working more often Later age of onset (Summary: greater social stability)	Psychopathological variables on psychiatric evaluation form Level of alcoholism
"Follow-up study" (Note 3): more than 2000/?; $\bar{X}$age=?; sex?; I or 0?; treatment?; outcome criteria?; up to 18 mos. (starting?).	Lack of behavioral impairment High social class Social stability	(Not reported)

are reorganized and presented by predictor variable in Table 2. Again, the format is similar to that used by Gibbs and Flanagan (1977) in their review. The predictor variables in Table 1, both significant and nonsignificant, are grouped into seven categories in Table 2: demographic, socioeconomic, motivational, social stability, drinking history, personality, and miscellaneous. Each predictor variable is listed in the first column of Table 2. In columns 2, 3, and 4 are presented, respectively, the number of treatment groups in the literature in which the variable, as stated, predicted successful treatment outcome, the number of treatment groups in which the variable was of no predictive value, and the number of treatment groups in which the opposite of the variable predicted successful treatment outcome (that is, in which the variable as stated predicted unsuccessful outcome). By scanning Table 2, the reader can determine the frequency with which the various predictor variables have been investigated, the proportion of times each variable was found to be a significant predictor of outcome, and the consistency with which each variable's predictive effects were in one direction (for example, older age predicting successful outcome rather than unsuccessful outcome).

In compiling the information in Table 2, some arbitrary decision rules were adopted. When more than one article presented data based on the same subjects ("treatment group"), the results appear only once in Table 2, except when reanalysis in subsequent articles produced results discrepant from or elaborating on those in the original article. When a variable had different predictive effects for different subsamples in a study (such as male versus female subjects, or subjects exposed to different forms of treatment), the subsamples were considered

Table 2

Summary of Previous Findings on Predictors of Treatment Outcome

Predictor Variable	Number of Treatment Groups where Variable Predicts Successful Outcome	Number of Treatment Groups where Variable is of no Predictive Value	Number of Treatment Groups where Opposite of Variable Predicts Successful Outcome
Demographic Variables			
Age (older)	21	16	1
Sex (male)	2	11	2
Race (white)	4	3	1
Nationality (U.S.A.)	0	1	0
Place of residence (rural)	1	1	0
Religious affiliation (Protestant)	3	6	1
Religious activity (moderate)	1	1	0
No. of siblings (few)	1	1	0
Birth rank in sibship	0	5	0
No. of children	0	1	0
Military service	0	1	0
Parents first or second generation U.S.A.	1	0	0
Socioeconomic Variables			
Socioeconomic status (high)	7	6	0
Social background, father's occupational level (high)	2	0	0
Education (more years)	8	10	1
Occupation (high status)	7	7	2
Recent occupation	0	1	0
Economic status, income, military pay grade (high)	2	3	0
Economic resources or situation	1	1	0
Motivational Variables			
Motivated	4	1	0
Self- or voluntarily referred	2	4	0

Table 2 (continued)

Predictor Variable	Number of Treatment Groups where Variable Predicts Successful Outcome	Number of Treatment Groups where Variable is of no Predictive Value	Number of Treatment Groups where Opposite of Variable Predicts Successful Outcome
Type or status of commitment or admission	0	2	0
Willing to take antabuse	0	1	0
Possibly willing to affiliate with A.A. later	1	0	0
Situational discomfort	0	1	0
(Note: See "sober at admission" and "previous A.A. experience" under Drinking History Variables.)			
Social Stability Variables			
Social stability, lack of social deterioration (composite indices; conclusions)	12	1	0
Marital status (generally, married, but catagorized in various ways)	21	12	0
Marital stability, quality, or cohesion; lack of marital discord or infidelity; length of marriage (long)	6	4	1
Age at marriage (young)	0	1	0
Social competence	2	2	1
Socialization, personal ties, close friends, club memberships	4	2	0
Sexual disturbance or homosexuality	0	1	1
Premarital promiscuity	0	0	2
Family's support; wife's positive attitude toward patient when sober	1	1	0
Handling of family and interpersonal problems	1	0	0
Contact with mother	0	0	1
Have a home; maintain a household	2	0	0

Table 2 (continued)

Predictor Variable	Number of Treatment Groups where Variable Predicts Successful Outcome	Number of Treatment Groups where Variable is of no Predictive Value	Number of Treatment Groups where Opposite of Variable Predicts Successful Outcome
High residential stability; low number of moves; residential adjustment	3	0	0
Live with family or friends (not alone)	5	1	0
Occupational stability; occupational regularity; length of job (long); amount of time employed; no. of job changes (few)	14	5	0
Job progress (lack of vocational impairment)	2	0	0
Employed at admission (not on welfare)	6	4	0
Wife employed	0	0	1
Arrests, convictions, prison time (more)	1	4	11
Honorable service discharge	1	0	0
Relatives in prison	0	0	1
Drinking History Variables			
"Drinking history"	0	3	0
Type of drinking (intermittent, periodic, loss of control, binge, spree; not continuous or daily)	4	6	1
Spree or continuous (not both) drinking	1	0	0
Consumption per day (more)	1	3	1
Place of drinking	0	1	0
Duration of drinking problem or addiction (long)	5	14	1
Age at onset of drinking problem (young)	0	3	3
Age at first drink or first intoxication (young)	1	1	1

Table 2 (continued)

Predictor Variable	Number of Treatment Groups where Variable Predicts Successful Outcome	Number of Treatment Groups where Variable is of no Predictive Value	Number of Treatment Groups where Opposite of Variable Predicts Successful Outcome
Preferred beverage (whiskey, beer, culturally accepted drinks; not cheap wine)	1	2	0
Parents problem drinkers (vs. exposure to alcoholism away from home)	0	4	2
Spouse drinker	0	2	0
Subculture (in which heavy drinking is uncommon)	1	0	0
Length of longest period of sobriety (long); amoung of previous sobriety (more in past 1 or 2 years); high "sobriety rating"	7	0	0
Sober at admission; sober for longer time immediately preceding admission; lack of need for detoxification	4	0	0
Longest period of sobriety resulted from A.A. and other treatment	1	0	0
No. of previous admissions for alcoholism treatment; no. of previous admissions to same facility (none or few)	10	8	2
Previous A.A. experience (more)	5	2	0
Set abstinence as goal	0	0	1
Define self as alcoholic	1	0	1
"Loss of control of drinking" factor	0	1	0
Severity, phase, or level of acloholism (severe)	0	4	0
Withdrawal symptoms (more or more severe)	2	4	3
Physical complications, medical problems (few); general health	2	6	0
Loss of jobs; time lost from work due to alcoholism	0	2	1

Table 2 (continued)

Predictor Variable	Number of Treatment Groups where Variable Predicts Successful Outcome	Number of Treatment Groups where Variable is of no Predictive Value	Number of Treatment Groups where Opposite of Variable Predicts Successful Outcome
Family consequences, wife's hardship	0	1	2
Spouse's attitude	0	1	0
Behavioral impairment; personal dilapidation	0	1	1
"Assessment of drinking"	0	1	0
Previous attempts to change	0	1	0
History of "habitual symptomatic drinking"	1	0	0
Diagnosis of "simple alcoholism" or "pure and subchronic abuse"	2	0	0
Diagnosis of "chronic alcoholism"; chronicity	0	1	1
Symptom pattern	0	1	0
Personality Variables			
Overall mental health; syntonic personality; good previous personality; ego strength; less history of psychiatric treatment or psychotherapy	7	2	5
Neurotic	10	2	1
Anxiety (including 16PF)	2	0	1
Depression, dysphoria, suicide attempts	2	3	4
Obsessive-compulsive; MMPI Pt; rigid	5	0	0
Hysteria; dissociative neurosis	0	0	2
Personality disorder, severe personality disorder	0	0	6
Antisocial; dyssocial; MMPI Pd; not responsible	0	2	14
Hostile; angry; aggressive; assaultive; not friendly; "expressed hostile dominance and failure to express affection" factor	0	2	3

Table 2 (continued)

Predictor Variable	Number of Treatment Groups where Variable Predicts Successful Outcome	Number of Treatment Groups where Variable is of no Predictive Value	Number of Treatment Groups where Opposite of Variable Predicts Successful Outcome
Passive aggressive; angry withdrawal	1	1	1
Paranoid; suspicious; MMPI Pa; feel persecuted	3	0	1
Hypomanic (MMPI Ma); elation	0	1	2
Cyclothymic	1	0	0
Inadequate personality	0	0	2
Psychosis; schizophrenia; MMPI Sc; poor reality testing	2	1	6
Schizoid	1	0	1
Organic brain syndrome; Memory-for-Designs test	0	1	4
Intelligent	12	7	1
"Original IQ"	0	1	0
Aptitudes	0	1	0
Vocational interests	0	1	0
Field dependence	1	0	3
Internal locus of control	0	2	0
If depressed, perceive control in powerful others	1	0	0
If sociopathic, perceive control in chance	1	0	0
Extraverted; not introverted, shy, inhibited, or withdrawn	2	0	2
Good self-esteem, self-perception, or self-confidence; favorable view of self and others	2	4	1
Active; not passive (WAIS)	1	0	1
Defensive; denying; MMPI L, K; not admitting	0	0	3
Dependency; group dependency; passive-dependent; not independent or autonomous	2	0	0
Aspiration, drive, goal tension, achievement needs	0	0	1
Dominant; not submissive (16PF) or deferent	1	0	0
Need for exhibition	1	0	0
Need for change	1	0	0

Table 2 (continued)

Predictor Variable	Number of Treatment Groups where Variable Predicts Successful Outcome	Number of Treatment Groups where Variable is of no Predictive Value	Number of Treatment Groups where Opposite of Variable Predicts Successful Outcome
Heterosexuality (not latent homosexual)	1	0	0
Likability	1	0	0
Rorschach variables:			
Creative maturity	1	0	0
Sensitivity	1	0	0
Controlled interpersonal warmth	1	0	0
Persistence	1	0	0
Productivity and effort	1	0	0
Fantasy ideation	1	0	0
Independence and lack of suggestibility	1	0	0
16PF variables:			
Conscientious	0	1	0
Imaginative	0	1	0
Forthright	0	1	0
Placid	0	1	0
Conservative	0	1	0
Undisciplined self-concept	0	1	0
Expedient	0	1	0
Practical	0	1	0
Shrewd	0	1	0
Experimenting	0	1	0
Anomie	0	1	0
Dream about drinking	1	0	0
Sincere	1	0	0
Unhappy childhood	0	2	0
Parental deprivation in childhood and early adolescence	0	0	1
Social apprehension	1	0	0
Naive	1	0	0
Sentimental	1	0	0
Gregarious with simple tastes	1	0	0
Socially unskilled	1	0	0
Lacking insight	1	0	0
Trusts accepted values	1	0	0
Critical	1	0	0

Table 2 (continued)

Predictor Variable	Number of Treatment Groups where Variable Predicts Successful Outcome	Number of Treatment Groups where Variable is of no Predictive Value	Number of Treatment Groups where Opposite of Variable Predicts Successful Outcome
Self-blaming, but presents to others as outgoing and happy	1	0	0
Psychopathological variables on psychiatric evaluation form	0	1	0
Diagnosis	0	1	0
"Personality", "personality type"	0	2	0
Miscellaneous Variables			
Cigarette smoking	0	1	0
Subjective prognostic estimate or rating	3	0	0
Prognostic rating based on Rorschach	1	0	0
Sleep disturbance	0	1	0
Attitude toward interviewer	0	1	0
Total past adjustment	0	1	0
Balance in family task participation	1	0	0
Realistic job plans	1	0	0
Wife's degree of disturbance (MMPI)	0	1	0
Wife antisocial (MMPI Pd)	0	0	1
Spouse not hostile	1	0	0
Prognostic rating based on motivation, economic resources, and diagnosis	1	0	0

as separate treatment groups regarding the findings on that and only that variable. When psychological test scores were found to be significant predictors, the findings were categorized under the generic personality variable. For example, a significant finding for the MMPI D scale would be classified under the variable, "depression." In perusing the third column of Table 1, the reader may have noted some authors who found no predictive effects for all or most subscales of psychological tests, such as "16PF scales." In order to avoid the arbitrariness and cumbersomeness of trying to classify these findings generically, they were deliberately overlooked in collaborating the information for Table 2. The reader must therefore be cautioned that for some personality variables, the figures representing the number of times the variables were found to be of no predictive value is an underestimate. Finally, it should be remembered that some authors failed to report those intake variables which they tested but found to be of no predictive value. A general effect of this phenomenon is that the figures presented in Table 2 overestimate the predictive power of an unknown number of the predictor variables.

Predictors of Long Treatment Involvement

Explanation of Table 3. While Table 1 provided a comprehensive tabular review of the literature on predicting treatment outcome, Table 3 presents the results of 35 studies on the prediction of long treatment involvement (length of stay in treatment, treatment program completion, or number of treatment sessions attended). Again, the studies are arranged alphabetically by first author's last name. In the first column of Table 3, the following eight characteristics of the

studies are presented in an abbreviated format:

(1) Author(s) last name(s).

(2) Year of publication, in parentheses.

(3) N_1/N_2: N_1 is the number of subjects whose data were actually used in the analysis; N_2 is the number of subjects potentially available for study in the author's sample.

(4) "$\bar{X}$age": The mean age of subjects in the study.

(5) Sex of the subjects: male only ("m"), female only ("f"), or both male and female ("m & f").

(6) Treatment setting: inpatient ("I"), outpatient ("O"), or a combination of the two (such as "I followed by O").

(7) Primary treatment modalities to which subjects were exposed, according to the following key:

a - Antabuse

A.A. - Alcoholics Anonymous

b - Behavior therapy (conditioned reflex therapy, discrimination training, decisions about drinking)

d - Detoxification

g - Group psychotherapy

h - Halfway house

m - Other or unspecified medication

p - Individual psychotherapy

y - Hypnosis

(8) Outcome criterion (how length of treatment involvement was assessed), according to the following key:

"Cmpl" - Completion of treatment program of specified length, versus dropping out of program before completion.

"LoS" - Length of stay in treatment, measured in time from admission to termination.

"# cntc" - Number of treatment contacts, such as number of outpatient psychotherapy sessions.

As was the case with Table 1, in the second column of Table 3 are listed, for each study, those intake variables which were found predictive of long treatment involvement. The variables are worded such that a patient possessing more of the characteristic as stated is likely to remain in treatment longer or is more likely to complete treatment than a patient with less of the characteristic. Column three of Table 3 provides, for each study, a list of intake variables which were unrelated to length of treatment involvement.

Explanation of Table 4. Table 4 organizes the information in Table 3 by predictor variable, in order to provide the reader with a sense of which intake variables have been found most predictive of length of treatment involvement in previous research. All predictor variables (both significant and nonsignificant) from Table 3 are grouped into seven categories in Table 4: demographic, socioeconomic, motivational, social stability, drinking history, personality, and miscellaneous. Each predictor variable from previous literature is listed in the first column of Table 4. In the subsequent columns are presented, respectively, (1) the number of treatment groups in which the variable, as stated, was found to predict long treatment involvement, (2) the number of treatment groups in which the variable was of no predictive value, and (3) the number of treatment groups in which the opposite of the stated variable predicted long treatment involvement (that is, in which the variable as stated predicted short treatment involvement). In

Table 3

Results of Previous Research on

Predicting Length of Stay in Treatment and Program Completion

Author(s) and Characteristics of Study	Predictors of Long Treatment Involvement	Nonpredictors
Baekeland, Lundwall, & Shanahan (1973): 143/143; $\bar{X}$age=41; m & f; O; m; LoS.	Less anxious No family history of alcoholism Motivated Good impulse control (previous abstinence and A.A. contact) Characteristics of immediate dropouts: Family history of alcoholism Ambivalent about starting treatment Currently drinking Living alone Anxious Depressed Less impaired due to drinking Characteristics of rapid dropouts: Good initial motivation Low impulse control Symptomatic Characteristics of slow dropouts: Low education Family history of alcoholism Little abstinence Rejected A.A.	Age Income Work status Sex Early traumatic separation Self-referral
Blane & Meyers (1963): 99/100; $\bar{X}$age=?; sex?; O; p; # cntc.	Dependent (not counterdependent) Socially isolated Low socioeconomic status	(None reported)
Bowen & Androes (1968): 79/79; $\bar{X}$age=45; sex?; I; m; comp.	(None reported)	Age Marital status Socioeconomic status

Table 3 (continued)

Author(s) and Characteristics of Study	Predictors of Long Treatment Involvement	Nonpredictors
Diffendale (1975): ?/?; $\bar{X}$age=?; sex?; O following I; treatment?; # cntc.	Older age Employment stability Areas of life seen by patient as threatened by alcohol	Stated motivation Neurosis Hostility IPAT 8 Anxiety Battery Depressive Adjective Checklist Need for affiliation Withdrawal Nurturance Succorance
Fitzgerald, Pasewark, & Clark (1971): 531/?; $\bar{X}$age=42.5; m & f; I; "broad spectrum" treatment; cmpl.	Male, for first admission	(Not reported)
Fitzgerald, Pasewark, & Tanner (1967): 450/?; $\bar{X}$age=43; m & f; I; treatment?; cmpl.	EPPS scales: For males: Autonomy Affiliation Aggression For females: Dominance	Other EPPS scales
Gerard & Saenger (1966): 800/?; $\bar{X}$age=?; m & f; O; p; # cntc. & LoS.	High social stability	Socioeconomic status
Gertler, Raynes, & Harris (1973): 84/84; $\bar{X}$age=?; sex?; O; "broad spectrum therapy"; LoS.	Longest period of abstinence longer than 1 year Longest period of abstinence more remote Less A.A. involvement	Rate of hospitalization Ego strength
Gross & Nerviano (1973): ?/?; $\bar{X}$age=42; m; I; treatment?; cmpl.	None	16PF scales and factors EPPS scales Personality Research Form scales

Table 3 (continued)

Author(s) and Characteristics of Study	Predictors of Long Treatment Involvement	Nonpredictors
Hague, Donovan, & O'Leary (1976): 110 volunteers/ ?; $\bar{X}$age=47.2; m; I; treatment?; initial commitment and cmpl.	None	MMPI scales MMPI F-K index Manifest anxiety Social desirability Ego strength Dependency IQ Cornell Index Perceptual differentiation Locus of control Defense Mechanism Inventory
Heilbrun (1971): 120 (initial) & 335 (cross-validation)/?; $\bar{X}$age=42.1; m & f; O; a, g, h; LoS.	Education at least 12 years IQ at least 103 MMPI Sc scale no more than 59 MMPI Ma scale no more than 53	Age Sex Race Marital status Other MMPI scales Memory for Designs Test
Hoffmann & Jansen (1973): 251/?; $\bar{X}$age=44.9; m; I; treatment?; LoS, type of discharge.	MMPI: High on L and K (defensive and denying) Less compulsive (Pt) Lower Ma	Other MMPI scales
Hoy (1969): 75/?; $\bar{X}$age= 41.7; sex?; I; g; cmpl.	16PF: Less surgent (more depressed) Less extraverted	Other 16PF scales, including anxiety Age Marital status Occupational level Education
Huber & Danahy (1975): 40/40 or 102/102?; $\bar{X}$age=46.5; m; I; g, p; cmpl.	Low MMPI Pd scale	Other MMPI scales MMPI special scales: MacAndrew Alcoholism scale Unitary Alcoholism Factor scale

Table 3 (continued)

Author(s) and Characteristics of Study	Predictors of Long Treatment Involvement	Nonpredictors
Karp, Kissin, & Hustmyer (1970): 37/37; $\bar{X}$age=?; sex?; O; p, m; LoS.	For psychotherapy: Less field dependent	For drug therapy: Field dependence
Kissin, Platz, & Su (1970): ?/480; $\bar{X}$age=?; m; (1) O; m; (2) O; p, m; (3) I; treatment?; outcome criterion?	For psychotherapy: Higher education High occupational status Psychologically intact For inpatient rehab.: Low occupational status Psychologically unstable	Age Race Religion Marital status Occupational stability Arrests Place of drinking
Krasnoff (1976): 66/?; $\bar{X}$age=?; m; I; treatment?; cmpl.	High on MMPI L scale (present self in socially desirable way) Greater need for approval Greater motivation for abstinence	Other MMPI scales Locus of control Age Marital status Socioeconomic status
Krasnoff (1977): 61/?; $\bar{X}$age=?; m; I; treatment?; cmpl.	(None)	MMPI special scales: Control Denial Admission Dependence
McWilliams & Brown (1977): 120/?; $\bar{X}$age= 42.5; m; I; "broad spectrum therapy"; cmpl.	(None)	MMPI scales MMPI special scales: Ego strength Maladjustment Emotional distress Repression Dependency Dominance Responsibility Social status Manifest anxiety Social desirability

Table 3 (continued)

Author(s) and Characteristics of Study	Predictors of Long Treatment Involvement	Nonpredictors
Miller, Pokorny, & Hanson (1968): 201/?; $\bar{X}$age=?; m; I; treatment?; cmpl.	(1) Don't leave difficult situations Older age Separated or divorced from spouse for shorter time Longer marriage Want to return to same living situation Fewer previous admissions Left fewer previous treatments against medical advice Less psychiatric and discipline trouble in service Rate self as less mentally ill More able to handle work requiring responsibility and dependability More motivated to work More self-esteem Less shy and isolated More pride in work More friendly Less passive More participation in community activities Less pessimistic Seeks less emotional support Less overall pathology on MMPI (trend) Lower Pd (MMPI) (trend) Lower Hs (MMPI) (trend) Less hostile More control over hostility	Length of military service Education IQ Race No. of marriages Marital status With whom living Father's socioeconomic status No. of psychiatric hospitalizations Other MMPI scales

Table 3 (continued)

Author(s) and Characteristics of Study	Predictors of Long Treatment Involvement	Nonepredictors
Miller, et al. (1968) (continued)	Don't handle stress by getting drunk More mature Stronger ego boundaries Less trouble with sex Higher F+% (Holtzman) Not transferred from another ward Make own decision to get treatment Shorter history of heavy drinking Fewer abstinent siblings Find alcohol less psychologically useful Don't always get drunk when drink Shorter length of most recent binge Less group therapy in last 5 years Summary: Less severe alcoholism More stable	
Mozdzierz, Macchitelli, Conway, & Krauss (1973): 22/?; $\bar{X}_{age}$=40.3; m; I; treatment?; cmpl.	(1) Dependent (MMPI Dy) Don't deny problems (MMPI Dn) Less defensive (MMPI K) Admit to general psychological distress (MMPI Ad)	(None)
Nelson & Hoffmann (1972): 72/76; $\bar{X}_{age}$=46.9; m; I; d; LoS.	Differential Personality Inventory: Less repression Less defensive More insomnia More broodiness More familial discord	(Not reported)

Table 3 (continued)

Author(s) and Characteristics of Study	Predictors of Long Treatment Involvement	Nonpredictors
Nelson & Hoffmann (1972) (continued)	Differential Personality Inventory (continued): More hostility More ideas of persecution More irritability More somatic complaints Summary: More subjective discomfort	
O'Leary, Calsyn, Chaney, & Freeman (1977): 73/87 completers of inpatient phase; $\bar{X}$age=46.4; m; I followed by O; d, g; cmpl. of aftercare.	External locus of control MMPI-168 factors: Somatization (direction?) Psychotic distortion (direction?) Depression (direction?)	MMPI-168 factors: Low morale Acting out
O'Leary, Rohsenow, & Donovan (1976): 153/?; $\bar{X}$age=?; m; I followed by O; d, g; LoS & Cmpl. of aftercare.	(None)	Locus of control Age Education
O'Leary, Rohsenow, Schau, & Donovan (1977): 54/?; $\bar{X}$age=?; m; I followed by O; d, g; cmpl. of aftercare.	Use "reversal" as defense mechanism	9 other defense mechanisms
Orford (1974): 50/?; $\bar{X}$age=?; sex?; I; h; LoS.	Nonsimplistic thinking about others (trend on 2 measures) (related to personality disorder)	IQ

Table 3 (continued)

Author(s) and Characteristics of Study	Predictors of Long Treatment Involvement	Nonpredictors
Pisani & Motansky (1970): 30/?; $\bar{X}$age=?; sex?; O following I; g; LoS.	High socioeconomic status Fewer siblings Married at younger age (trend)	Age Education Religion Race Salary Place of birth Generation in U. S. Marital status Living arrangements No. of children Previous marriages Military service Sibling position Parental loss in childhood
Pokorny, Miller, Kanas, & Valles (1973): 122/307; $\bar{X}$age=?; m; O following I; g; # cntc.	Think alcoholism is a disease Drink alone Don't drink wine Less frequent or shorter hallucinations Shorter last drinking bout Less loss of productive work capacity Have been married Lived with wife longer Less socially isolated Less anxious Less indifferent Better reality testing Less time in hospitals Less time in jail Fewer moves Fewer arrests Summary: More stable	Drinking pattern Age of onset

Table 3 (continued)

Author(s) and Characteristics of Study	Predictors of Long Treatment Involvement	Nonpredictors
Pryer & Distefano (1970): 691/?; $\bar{X}$age=?; m; I; treatment?; cmpl.	(None)	EPPS scales
Ravensborg (1973): 62/?; $\bar{X}$age=?; m; I; A.A.; cmpl.	Less downhearted, restless, and worn-out More good-natured	Age Education Marital status No. of children No. previous hospitalizations Type of commitment Denial
Rubington (1970): ?/?; $\bar{X}$age=?; sex?; I; h; LoS.	Not jail-referred More previous treatments	(None reported)
Wallerstein (1957): ?/?; $\bar{X}$age=?; m; I; g, p; cmpl.	Neurotic Not strong aggressive tendencies	(Not reported)
Wilkinson, Prado, Williams, & Schnadt (1971): 132/132; $\bar{X}$age=44; m; I; g; cmpl.	Deference (EPPS) Less personality control (MMPI) Perceive self and ideal people as having weak needs Began drinking at later age More stable marital history More stable job history	Kuder Preference Test scales Allport-Vernon Scale of Values Shipley IQ Other EPPS scales Other MMPI scales
Zax (1962): 234/234; $\bar{X}$age=?; sex?; 0; treatment?; # cntc.	No. of contacts at previous clinic admission	Reopened case
Zax, Marsey, & Biggs (1961): 250/?; $\bar{X}$age=?; m; I; m; # cntc.	Married and living with wife Referred by self or family (not friend or court)	Age Education Occupational skills Place of birth Duration of problem Occupational stability Religious background

Table 3 (continued)

Author(s) and Characteristics of Study	Predictors of Long Treatment Involvement	Nonpredictors
Cohen, Cohen, & Barr (Note 4): ?/?; $\bar{X}$age= ?; sex?; I followed by O; "intensive therapy"; cmpl.	Personality Research Form: Aggressive High play	(None reported)

Table 4

Summary of Previous Findings on Predictors of

Length of Stay in Treatment and Program Completion

Predictor Variable	Number of Treatment Groups where Variable Predicts Long Treatment Involvement	Number of Treatment Groups where Variable is of no Predictive Value	Number of Treatment Groups where Opposite of Variable Predicts Long Treatment Involvement
Demographic Variables			
Age (older)	2	10	0
Sex (male)	1	2	0
Race (white)	0	4	0
Religious affiliation or background (Protestant)	0	3	0
No. of siblings (few)	1	0	0
Birth rank in sibship	0	1	0
No. of children	0	2	0
Military service	0	1	0
Parents first or second generation U.S.A.	0	1	0
Place of birth	0	2	0
Socioeconomic Variables			
Socioeconomic status (high)	1	3	1
Social background; father's occupational level (high)	0	1	0
Education (more years)	3	6	0
Occupation (high status)	1	1	1
Economic status; income; salary; military pay grade (high)	0	2	0
Motivational Variables			
Motivated; motivation for abstinence; stated motivation	2	1	1
Self- or voluntarily referred; make own decision to get treatment; not jail referred	3	0	0
Type of commitment	0	1	0

Table 4 (continued)

Predictor Variable	Number of Treatment Groups where Variable Predicts Long Treatment Involvement	Number of Treatment Groups where Variable is of no Predictive Value	Number of Treatment Groups where Opposite of Variable Predicts Long Treatment Involvement
Ambivalent about starting treatment	0	0	1
More motivated to work	1	0	0
(Note: See "Previous A.A. experience" and "sober at admission" under Drinking History Variables)			
Social Stability Variables			
Social stability; lack of social deterioration (composite indices; conclusions)	2	0	0
Marital status (generally, married, but categorized in various ways)	2	8	0
Marital stability, quality, or cohesion; lack of marital and familial discord; longer marriage; lived with wife longer; fewer previous marriages; separated or divorced for shorter time	4	2	1
Socialization; personal ties; close friends; club memberships; not socially isolated	2	0	1
Sexual disturbance or homosexuality	0	0	1
High residential stability; low number of moves	1	0	0
Live with family or friends (not alone)	1	2	0
High occupational stability; occupational regularity; steady job; amount of time employed; fewer job changes	2	2	0
Job progress (lack of vocational impairment)	1	0	0

Table 4 (continued)

Predictor Variable	Number of Treatment Groups where Variable Predicts Long Treatment Involvement	Number of Treatment Groups where Variable is of no Predictive Value	Number of Treatment Groups where Opposite of Variable Predicts Long Treatment Involvement
Employed at admission (not on welfare)	0	1	0
Arrests, convictions, prison time (more); discipline trouble in service	0	1	2
Drinking History Variables			
Type of drinking; drinking pattern (intermittent, periodic, binge, spree, loss of control; not continuous, daily, inability to abstain)	0	1	0
Place of drinking	0	1	0
Drink alone	1	0	1
Duration of drinking problem or addiction (long)	0	1	1
Age at onset of drinking problem (young)	0	1	1
Preferred beverage (whiskey, beer, culturally accepted drinks; not cheap wine)	1	0	0
Parents problem drinkers	0	0	1
Few abstinent siblings	1	0	0
Length of longest period of sobriety (long); amount of previous sobriety (more in past 1 or 2 years)	1	0	1
Recency of longest period of sobriety (recent)	0	0	1
Sober at admission; sober for longer time immediately preceding admission; lack of need for detoxification	1	0	0
Latest drinking episode (recent, long, severe)	0	0	2

Table 4 (continued)

Predictor Variable	Number of Treatment Groups where Variable Predicts Long Treatment Involvement	Number of Treatment Groups where Variable is of no Predictive Value	Number of Treatment Groups where Opposite of Variable Predicts Long Treatment Involvement
No or few previous admissions for alcoholism treatment; no or few admissions to same facility; less time in hospitals	2	3	1
Long stay in or good adjustment to previous programs	2	0	0
Previous A.A. experience (more)	1	0	1
Think alcoholism is a disease	1	0	0
Severity, phase, or level of alcoholism (severe)	0	0	1
Withdrawal symptoms (more frequent or more severe)	0	0	1
Behavioral impairment; impairment due to drinking; personal dilapidation	2	0	0
"Symptomatic"	0	0	1
Handle stress by getting drunk	0	0	1
Find alcohol psychologically useful	0	0	1
MMPI alcoholism scales	0	1	0
Personality Variables			
Overall mental health; ego strength; strong ego boundaries; less history or psychiatric treatment or psychotherapy	4	4	2
Neurotic	1	1	0
Anxiety	0	4	2
Depression; broodiness; suicide attempts	1	1	3
Obsessive compulsive	0	0	1
Hypochondriasis (MMPI) or somatic complaints	1	0	1

Table 4 (continued)

Predictor Variable	Number of Treatment Groups where Variable Predicts Long Treatment Involvement	Number of Treatment Groups where Variable is of no Predictive Value	Number of Treatment Groups where Opposite of Variable Predicts Long Treatment Involvement
Personality disorder; severe personality disorder	0	0	1
Antisocial; MMPI Pd; not responsible	0	1	2
Hostile; angry; aggressive; assualtive; not friendly	3	1	3
Paranoid; ideas of persecution	1	0	0
Hypomanic	0	0	2
Psychosis; schizophrenia; low Holtzman F+; poor reality testing	0	0	3
Organic brain syndrome; Memory-for-Designs test	0	1	0
Intelligent	1	4	0
Aptitudes; occupational skills	0	1	0
Vocational interests	0	1	0
Field dependence	0	1	1
Internal locus of control	0	3	1
Extraverted; not introverted, shy, isolated, or withdrawn	1	1	1
Good self-esteem, self-perception, or self-confidence	1	0	0
Active; not passive	1	0	0
Defensive; denying; MMPI L, K, Dn; not admitting	1	2	2
Overcompensation	0	2	0
Rationalization	0	2	0
Reaction formation	0	2	0
Reversal	1	1	0
Turning against an object	0	2	0
Dependency; group dependency; passive dependent; not independent, autonomous, or counterdependent	2	3	1
Nurturant	0	1	0
Succorant; needing emotional support	0	1	0

Table 4 (continued)

Predictor Variable	Number of Treatment Groups where Variable Predicts Long Treatment Involvement	Number of Treatment Groups where Variable is of no Predictive Value	Number of Treatment Groups where Opposite of Variable Predicts Long Treatment Involvement
Dominant; not submissive or deferent	1	1	1
Need for approval	1	0	0
Need for affiliation	1	1	0
Optimism; not pessimism	1	0	0
Play	1	0	0
16PF variables:			
Conscientious	0	1	0
Imaginative	0	1	0
Forthright	0	1	0
Placid	0	1	0
Conservative	0	1	0
Undisciplined self-concept	0	1	0
Expedient	0	1	0
Practical	0	1	0
Shrewd	0	1	0
Experimenting	0	1	0
Early traumatic separation; parental loss in childhood	0	2	0
Social desirability; MMPI L	1	2	0
Perceptual differentiation	0	1	0
Personality control (MMPI)	0	1	1
MMPI social status	0	1	0
Tendency to leave difficult situations	0	0	1
Seeks emotional support	0	0	1
Mature	1	0	0
Insomnia	1	0	0
Irritability	1	0	0
MMPI-168 factors:			
Low morale	0	1	0
Acting out	0	1	0
Indifference	0	0	1
Perceive self and ideal people as having weak needs	1	0	0
Values (Allport-Vernon)	0	1	0

Table 4 (continued)

Predictor Variable	Number of Treatment Groups where Variable Predicts Long Treatment Involvement	Number of Treatment Groups where Variable is of no Predictive Value	Number of Treatment Groups where Opposite of Variable Predicts Long Treatment Involvement
	Miscellaneous Variables		
Want to return to same living situation	1	0	0
Able to handle work requiring responsibility and dependability	1	0	0
Pride in work	1	0	0
Length of military service	0	1	0
Transferred from another ward	0	0	1

assembling Table 4, the same decision rules were employed as were used to organize the literature on predicting treatment outcome in Table 2. The cautions which were stated regarding Table 2 also apply to Table 4.

Selection of Predictor Variables

The original intent of the study was to evaluate the predictor variables in the literature separately for alcoholism treatment outcome and for length of treatment involvement. Evaluation of the predictors of outcome could be accomplished independently of the literature on length of treatment involvement. However, inspection of Table 4 indicates that the converse is not true. Research into predicting length of treatment involvement has been particularly scattered and atheoretical, and very few predictor variables have been investigated enough times to provide a clear picture of which variables are the most consistent predictors. Therefore, the selection of predictor variables for investigation in this study for both outcome and length of stay was accomplished by combining the previous literature on predicting alcoholism treatment outcome and length of treatment involvement. Justification for doing this can be found in the literature, for length of stay in alcoholism treatment has been found to be strongly related to posttreatment abstinence and adjustment (for example, Bowen & Androes, 1968; Fitzgerald et al., 1971).

The intake variables presented below were judged to be the most consistent predictors of outcome and length of treatment involvement, based on the number of studies in which they were investigated and the percentage of significant findings among those studies. To conserve space, an additional table combining the literature on treatment outcome

and length of treatment involvement is not presented. However, by comgining the figures for a variable presented in Table 2 with the figures for the same variable in Table 4, the predictive value of the variable can be determined. The most predictive demographic variable was age. The strongest socioeconomic predictor variables were socioeconomic status, education, and occupation. Among motivational variables, referral source and ratings of motivation were highly predictive. The most consistent predictors among social stability variables were social stability, marital status, marital stability, socialization, residential stability, living with others, occupational stability, employed at admission, and amount of legal difficulty. The strongest predictors among drinking history variables were drinking pattern, age of onset of drinking problem, problem drinking by patients' parents, amount of previous sobriety, sobriety upon admission, number of previous treatments for alcoholism, previous involvement with Alcoholics Anonymous, and alcoholic withdrawal symptoms. The personality variables which were often predictive were overall mental health, neurosis, depression, obsessive compulsive traits, antisocial personality, anger and aggression, psychosis or schizophrenia, organic brain syndrome, intelligence, and defensiveness or denial. Prognostic rating was a predictive miscellaneous variable.

Some of the above-mentioned predictor variables can be combined or eliminated, based on conceptual considerations, pragmatic issues about the appropriateness of applying certain variables to the Independence House population, and/or the availability of data on Independence House patients. Education and occupation can be subsumed under the composite variable socioeconomic status, since education and occupation are the defining characteristics of socioeconomic status. Referral

source was found to be a consistent predictor of success in short-term treatment programs, with self- or voluntarily referred patients having the best prognoses. However, nearly all patients at the Independence House long-term program are referred from short-term inpatient programs. So, among Independence House patients, there is not enough variation in referral source to warrant investigation of referral source as a predictor of outcome. Reliable global ratings of former Independence House patients' motivation were not available, so "motivation" could not be used as a predictor. Since marital status, living with others, and occupational stability are among the variables which generally comprise composite indices of social stability, the former variables can be subsumed under the latter. Measures of marital stability and residential stability were not available to the author, so these two variables could not be investigated. "Employed at admission" is not relevant to Independence House patients: Nearly all of them are not employed at admission, because they come directly from other inpatient treatment centers. Sobriety upon admission is not applicable, for Independence House does not accept individuals who have not been abstinent for the 5 days preceding their application for admission. Information on patients' drinking pattern (binge vs. continuous) was not available. Organic brain syndrome was eliminated because: (1) Independence House does not accept clients who display symptoms of marked neurological deterioration, and (2) the only available purported measure of organicity, the conceptual qoutient of the Shipley Institute of Living Scale, is a poor discriminator of organic impairment (Yates, 1954).

After the above deletions and consolidations, the following 19

predictor variables remain for further discussion and for investigation in this study: age, socioeconomic status, social stability (comprised of marital status, living with others, and occupational stability), amount of legal difficulty, age of onset of drinking problem, problem drinking by patients' parents, amount of previous sobriety, number of previous alcoholism treatments, previous Alcoholics Anonymous involvement, alcoholic withdrawal symptoms, overall mental health, neurosis, depression, obsessive-compulsive traits, antisocial personality, anger and aggression, schizophrenia, intelligence, and defensiveness or denial.

A narrative review of the literature on each of the 19 selected predictor variables is now presented. For each variable, the literature regarding that variable's relationship to alcoholism treatment outcome is presented first, followed by the literature on its relationship to length of treatment involvement.

Age

Treatment outcome. Patients' age at admission is one of the most thoroughly investigated predictor variables in the alcoholism treatment outcome literature, perhaps because it is so easy to measure. Age has been found a significant predictor of alcoholism treatment success in slightly more than half of the studies in which it has been investigated. When significant effects for the variable have been found, they have been overwhelmingly in the direction of a better prognosis for older alcoholics.

In inpatient settings, Wolff and Holland (1964) found that an age of at least 45 years predicted both posttreatment abstinence and low likelihood of readmission, and Bateman and Petersen (1972) found that

an age of 45 or more years predicted abstinence. Cripe (1975) determined that older age predicted success among male alcoholics who were followed up for 18 months, and Rathod et al. (1966) learned that young alcoholics had poor prognoses while older subjects tended to fare better. In studies dealing with alcoholics in the Navy, Schmitt (1976) established that older patients (age 26 and up) benefited more from treatment in terms of personality change, and Edwards et al. (1973) noted that age was positively correlated with returning to active duty after alcoholism treatment. Goodwin et al. (1971) followed up convicted male felons with drinking problems 8 years after their release from prison, and found that the mean age of remitted subjects was 37 while the mean age of nonremissed subjects was 33. Blaney et al. (1975) observed that young age (20 through 29) indicated a poor prognosis for alcoholics in a large psychiatric hospital without a special alcoholism unit, but not for individuals in a 21-bed alcoholism treatment unit. In an English public mental hospital, Glatt (1961) initially found that for male alcoholics, a good prognosis was associated with older age (at least 51 years). However, when Glatt statistically controlled for psychopathy, the significant predictive effect of age disappeared. Tomsovic (1974) found that age was related to outcome for binge drinkers, but not for continuous drinkers.

Ritson (1968) declared that older age was one of only two variables which predicted posttreatment abstinence for both inpatient and outpatient alcoholics. Kissin et al. (1968) found age of at least 45 to predict treatment success across one inpatient and two outpatient programs, and Gilles et al. (1974) noted a trend for older alcoholics to improve on the Alcoholic Involvement Scale 12 months after inpatient

or outpatient treatment. Baekeland et al. (1971) observed that the average patient who benefited from outpatient disulfiram treatment was about 43 years old, and Wallerstein (1957) found a trend toward better response to disulfiram for alcoholics over age 37. In Wallerstein's study, age did not affect response to conditioned reflex treatment, hypnotherapy, or milieu therapy. Turning to outpatient clinics, Gerard and Saenger (1966) found a trend for older alcoholics (over age 55) to improve more than younger alcoholics (younger than age 35), and Choi (1973) stated that in a sample of alcoholics with a mean age of about 42, subjects in the age range 50 to 59 had the longest abstinence.

Age at admission was not predictive of outcome following inpatient alcoholism treatment in studies by Adamson et al. (1974), Davies et al. (1956), Gillis and Keet (1969), Gottheil et al. (1972), Harper and Hickson (1951), Heilbrun (1971), Kish and Hermann (1971), Mindlin (1960), Pemberton (1967), and Pokorny et al. (1968). In outpatient settings, age had no effect on outcome in studies by Haberman (1966), Madden and Kenyon (1975), Mindlin (1959), and Orford (1973). Gibbins and Armstrong (1957) found no effect on outcome due to age among alcoholics who remained in inpatient treatment at least 6 days and made at least 3 outpatient aftercare visits. Only one study was found in which a significant effect of age on outcome was not in the direction of better prognoses for older subjects: Rafaelson (1974) stated that the greatest proportion of improved individuals were in the age range 30 to 39 years. However, Rafaelson's sample was comprised of both alcohol and drug addicts.

The preponderance of evidence that older alcoholics respond better to treatment is in contradiction with the belief in general psychological

treatment that older individuals are more rigid and set in their ways, and therefore more resistent to change, than younger individuals. On this point, Wolff and Holland (1964) speculated that alcoholics who are older at admission are those who have survived longer in the community and who therefore have less severe personality disorders than their younger counterparts. Gerard and Saenger (1966) offered two suggestions. Their first speculation was that older alcoholics, having been ill for more years, have more severe disturbances and are thus more motivated to change. This hypothesis is supported by Rathod et al.'s (1966) finding that when examining the interaction between age and duration of alcoholism, older alcoholics with longer problems have the best outcomes. Gerard and Saenger's second explanation was that the rigidity of the older alcoholic is an aid to recovery rather than a hinderance. This speculation is not supported by the evidence, to be presented later, that defensive, denying alcoholics fare poorly, but it is supported by the findings, again discussed later, that obsessive-compulsiveness is a positive prognostic indicator for alcoholics. It also receives indirect support from O'Leary et al.'s (1977) tentative conclusion that recovery from alcoholism is a process of building up personality defenses.

Length of treatment involvement. Age is one of the few predictor variables which has been investigated for its effect on length of treatment involvement enough times to allow conclusions to be drawn. The typical finding has been that an alcoholic's age is unrelated to his length of involvement in treatment. Among inpatient alcoholics, age has been found to have no effect on time in program (Heilbrun, 1971) or on completion versus dropping out of programs (Bowen & Androes, 1968;

Hoy, 1969; Krasnoff, 1976; Ravensborg, 1973). In two studies, patients' age did not affect continuation in aftercare (O'Leary et al., 1976; Pisani & Motanky, 1970). In outpatient settings, age did not predict length of involvement or number of visits to medication clinics (Baekeland et al., 1971; Baekeland et al., 1973; Zax et al., 1961). Only two studies were located in which age was related to length of treatment involvement. Miller et al. (1968) found that completers of a 90-day V.A. hospital residential program were older than dropouts, and Diffendale (1975) found that age correlated with continuation in outpatient after-care following inpatient alcoholism treatment. It can be concluded that if age does have any real effect on length of treatment involvement, it is a very weak effect.

Socioeconomic Status

Treatment outcome. Socioeconomic status is a composite variable which is usually measured by combining a subject's education level, occupation level, and sometimes income level. There are several reasons to expect an alcoholic of high socioeconomic status to have a good prognosis. High socioeconomic status represents an asset or strength, and the individuals who respond best to psychological therapies are often those who have strengths to build on. Since alcoholics of high socioeconomic status have (by our cultural standards) achieved more in life than their less fortunate counterparts, they stand to regain more by achieving sobriety, and they may therefore be more motivated. In addition, facets of socioeconomic status are educational and occupational levels, which may be related to intelligence. Since (as will be seen later) intelligence has often been found to predict

treatment outcome, shared variance between intelligence and socioeconomic status may lead to socioeconomic status having predictive value.

Findings related to composite indices of socioeconomic status will be considered first, after which literature on some of the individual components of socioeconomic status will be summarized briefly. Ritson (1968) found that high social class was one of only two variables which predicted posttreatment adjustment for both inpatients and outpatients. Vogler et al. (1977) also found high socioeconomic status to be a useful predictor of abstinence in a mixed in- and outpatient sample of chronic alcoholics. Bromet et al. (1977), studying alcoholics across five residential programs, concluded that high socioeconomic status was among the strongest predictors of successful adjustment 6 to 8 months after treatment. In Zimberg's (1974) predominantly poor black alcoholic population at an urban clinic, higher socioeconomic status was associated with abstinence at a 1-year follow-up. A follow-up of over 2000 individuals after involvement in various alcoholism treatment centers revealed that high social class was one of the three best predictors of recovery (Follow-up study, Note 3). Willems et al. (1973) found that low socioeconomic status was an unfavorable prognostic sign for inpatient alcoholics. However, the authors remarked that long stay in treatment (up to 26 weeks) may diminish the unfavorable prognostic effects of low socioeconomic status. If this is true (Willems et al. did not support the remark well), then perhaps socioeconomic status will be a weaker predictor in a long-term treatment program such as Independence House.

In two studies, atypical curvilinear findings regarding the effect of social class on alcoholism treatment outcome emerged. Blaney et al.

(1975), studying inpatients in Northern Ireland, stated that middle (as opposed to high or low) social class predicted poor outcome. Bateman and Petersen (1971) found that socioeconomic status was of no predictive value for both sexes combined. However, when they analyzed results separately for the two sexes, social class did not affect outcome for southern inpatient males, but for females, high and low (as opposed to middle) social class was related to posttreatment abstinence (Bateman & Petersen, 1972). The fact that Bateman & Petersen used a rather unorthodox measure of social class (occupation, source of income, religion, and education) may account for their unusual results. Socioeconomic status had no effect on outcome in a group of English inpatients (Davies et al., 1956) and in a group of American outpatients in couples groups (Madden & Kenyon, 1975). In Canada, Adamson et al. (1974) found that social class did not affect abstinence following short-term inpatient treatment, and speculated that this negative finding was due to the narrow socioeconomic range of their population.

The various component variables of socioeconomic status have often proven to be related to treatment outcome, although the results have not been quite as consistent as for overall social class. One component of most measures of social class is education. Other things being equal, individuals with more years of formal education are considered to be of higher socioeconomic status. Education has often been found to be positively correlated with posttreatment abstinence and adjustment (e.g., Blaney et al. , 1975). There is some evidence that the predictive effect of education on alcoholism treatment outcome is reversed for females (Bateman & Petersen, 1972).

A second common component of socioeconomic status is occupational

level. High social class is associated with high status occupations such as professional and executive positions, while low social class is partially defined by low status occupations such as unskilled labor. As with education, high occupational class has often (e.g., Mindlin, 1960) but not always (e.g., Gilles et al., 1974) been found to predict alcoholism treatment success for at least males. Again, the effect may be reversed for females (Bateman & Petersen, 1971).

Although the most widely accepted measure of social class is the Hollingshead and Redlich Two Factor Index of Social Position which is comprised of educational level and occupational level (Myers & Bean, 1968), a third element which is occasionally used is income level. In fact, Hollingshead and Redlich originally utilized a three factor index of socioeconomic status, including income level, before discovering that the two-factor measure was just as reliable and valid and easier to compute. The literature on predicting alcoholism treatment outcome concurs with the exclusion of income level from measures of socioeconomic status, as income level has not been a particularly useful predictor of outcome (Baekeland et al., 1971; Gottheil et al., 1972).

In summary, alcoholics' socioeconomic status, assessed at admission to treatment, has often been found to be related to posttreatment abstinence and/or overall adjustment, with individuals in the higher social classes having better prognoses. The two most common components of indices of socioeconomic status, education and occupation level, have been fairly consistent predictors of treatment outcome, although there is some evidence that the predictive effects of these two variables is reversed for female alcoholics. The predictive validity of income level as an aspect of socioeconomic status remains undemonstrated

in the literature.

Length of treatment involvement. The effect of socioeconomic status on length of stay in alcoholism treatment is not clear from previous research. Pisani and Motanky (1970) found a significant relationship between low socioeconomic status and dropping out of outpatient group psychotherapy, and Pokorny et al. (1973) noted a tendency for attenders of aftercare groups following a V.A. hospital program to be of higher socioeconomic status than dropouts. Bowen and Androes (1968) and Krasnoff (1976), however, observed that program completers and dropouts were similar with respect to socioeconomic status, and Gerard and Saenger (1966), finding no effects from education or occupational status on extent of outpatient clinic contact, concluded that social class did not influence attendance. Blane and Meyers (1963), hypothesizing and finding that attenders of a hospital-based alcoholism clinic would be more dependent than dropouts, stated in their discussion that subjects of low socioeconomic status returned for services more often.

The previous findings on the effects of the components of socioeconomic status are even less convincing. Heilbrun (1971) found that at least 12 years of education was a useful predictor of length of stay in a residential program for chronic court-case alcoholics. Kissin et al. (1970) found that 12 or more years of education was predictive of acceptance of outpatient psychotherapy, but did not affect acceptance of outpatient pharmacotherapy or inpatient rehabilitation. Baekeland et al. (1973) examined the characteristics of immediate dropouts, rapid dropouts, slow dropouts, and attenders of an alcoholism clinic specializing in medical treatment, and noted that slow dropouts, when compared with

attenders, had little education. Oddly, rapid dropouts were better educated than slow dropouts. From the latter two studies, it seems that education facilitates involvement in psychotherapy and interferes with long treatment attendance when medication is the main treatment modality. However, a plethora of findings of no effect of education on length of treatment involvement across a variety of treatment settings casts serious doubt on the validity of this speculation (Baekeland et al., 1971; Hoy, 1969; Miller et al., 1968; O'Leary et al., 1976; Pisani & Motanky, 1970; Ravensborg, 1973; Zax et al., 1961). Regarding occupational status, Kissin et al. (1970) found that high occupational status predicted acceptance of outpatient psychotherapy but rejection of inpatient rehabilitation. However, in two other studies, occupation did not affect dropping out of an inpatient program (Hoy, 1969) or length of stay at a medically-oriented outpatient clinic (Zax et al., 1961). In another outpatient clinic with a pharamacological emphasis, current occupation was unrelated to attendance or dropping out immediately, rapidly, or slowly (Baekeland et al., 1973). Thus, the only uncontradicted significant result for occupation was that alcoholics with high status jobs tended to accept outpatient psychotherapy. This finding needs replication which cannot be provided in the present study. Only two studies were located in which income was examined for its effect on length of stay in treatment, and in neither case was income of any predictive value (Baekeland et al., 1971; Pisani & Motanky, 1970).

Social Stability

Treatment outcome. Social stability, which has been defined and measured in a number of ways, has been perhaps the most consistent predictor of positive treatment outcome in the literature on alcoholism.

The prototypal measure of social stability among alcoholics is a 4-point scale devised by Straus and Bacon (1951), in which 1 point is assigned for each of the following: (1) having held a steady job for at least 3 years, (2) residential immobility for at least 2 years, (3) either living in one's own home or in the home of relatives or friends, and (4) married and living with one's spouse. Some researchers have used variations of this scale to assess social stability. Gerard and Saenger (1966) gave newly admitted patients ratings of 0 to 2 on each of three variables (marital status, living situation, and employment status) in order to arrive at ratings of their social stability. They found social stability to be highly predictive of alcoholic outpatients' pre- to posttreatment improvement on an index of overall adjustment at a 6-month follow-up. The alcoholics with the best prognoses were those who were married, employed, and living with their families. Gibbins and Armstrong (1957) used Straus and Bacon's four variables to assess social stability: steady job, steady residence, living in one's own home or with relatives or friends, and married. Among alcoholics who had at least minimal involvement in an inpatient group psychotherapy program and outpatient follow-up groups, social stability predicted an increase in number of months of abstinence 9 to 55 months after treatment, compared to a similar time interval preceding treatment. Davies et al. (1956) defined a socially stable alcoholic as one who met at least one of these criteria: steady job for 3 years, same residence for at least 2 years, owns a home or lives with relatives or friends, and married. In their rather select group of alcoholics, most of whom were inpatients receiving individual psychotherapy and Antabuse, social stability was related to a favorable prognosis over a 2-year period.

In a more recent study, Williams (1977) used a 30-point scale based on 0 to 10 ratings of employment stability, residential and domestic stability, and social activities and contacts. This measure of social stability predicted improvement in number of days abstinent over a 12-month follow-up interval, as compared to the year preceding inpatient group therapy treatment. Finally, Willems et al. (1973) found that a social adjustment score based on living with others, good work record, and good legal record predicted abstinence for 2 years after inpatient treatment with outpatient follow-up.

While the researchers in the five studies reviewed above devised composite measures of social stability prior to collecting their data, other investigators have concluded that socially stable alcoholics have good prognoses after examining the individual variables which were significant predictors of improvement in their studies. Zimberg (1974) concluded that social stability predicted success in a ghetto alcoholism clinic after noting that patients with more abstinence after treatment tended to be married, not on welfare, not living in social isolation, of higher socioeconomic status, less impaired in vocational functioning, working more often, and with a later age of onset of their alcohol problems. Gillis and Keet (1969) noted that more stable, well-anchored patients (i.e., those with the least downward social movement and those able to make and keep interpersonal relationships) showed general improvement after a short-term inpatient program, with the follow-up period for most patients being at least 3 years. A follow-up study of over 2000 treated alcoholics revealed that social stability was among the best predictors of recovery (Note 3). Kissin et al. (1968) stated that social competence led to a favorable outcome among their

outpatient male alcoholics, after finding that a steady job, older age, periodic drinking, and some college education predicted abstinence and social and vocational improvement. When the same data were analyzed separately for different types of treatment, it was learned that socially competent alcoholics fared well in outpatient medication or psychotherapy treatment, but did not respond well to an inpatient rehabilitation program (Kissin et al., 1970). Trice et al. (1969) concluded that socially stable white male alcoholics (those with few arrests and state psychiatric hospitalizations) were likely to be treatment successes, based on a measure of overall adjustment taken an average of 28.5 months after subjects were in a broad spectrum state hospital alcoholism program. However, Trice and Roman (1970) used the same data base as Trice et al. (1969) to predict posttreatment A.A. affiliation, and found that social stability (marital stability, occupational adjustment, and residential stability) had no predictive effect.

Social stability was found to be at least somewhat predictive of alcoholism treatment outcome in two other studies, but flaws in design and presentation weakened the results. Gilles et al. (1974) found that in three of six clinics (two inpatient and four outpatient), the social stability subtest of a 35-item Alcoholism Involvement Scale predicted outcome at a 12-month follow-up. However, outcome was measured by a total score on the same Alcoholism Involvement Scale, and a scale predicting itself is hardly a startling finding. Madden and Kenyon (1975) stated that abstinence after outpatient group psychotherapy for alcoholics and their spouses was related to a high "social stability score", but they failed to specify how this score was derived.

In addition to composite indices and derivative impressions of

general social stability being highly predictive of alcoholism treatment outcome, the various components of social stability have considerable predictive value by themselves, although the findings have not been as consistent as for overall social stability. One frequent component of social stability is marital stability. Different investigators have categorized marital status in different ways, but the general finding has been that married (and sometimes widowed) alcoholics benefit more from treatment than single, separated, or divorced alcoholics (e.g., Glatt, 1961; Gerard & Saenger, 1966). An even more consistent predictor of alcoholism treatment success has been living situation, in that patients living with spouses, relatives, or friends, or owning their own houses, fare better than transients or those living alone, in missions, or in lodging houses (e.g., McCance & McCance, 1969). A history of regular employment has often been found to have a positive prognostic effect (e.g., Kissin et al., 1968).

To summarize, general social stability has overwhelmingly been found to predict favorable response to alcoholism treatment. There were only two instances found in the literature where this was not so: one study in which social stability predicted success for outpatients but not for inpatients, and one study in which social stability failed to predict A.A. affiliation. Although the findings for the various individual components of social stability have not been so unanimous, they still exhibited strong trends toward better prognoses for alcoholics with stable marital situations, residential situations, and work histories. The conclusion that socially stable alcoholics have better prognoses is not particularly surprising, for three reasons. First, better response to all psychological therapies is expected for patients

with more areas of intact functioning or with more "strengths" to build on, and there is no reason why therapy with alcoholics should violate this principle. Second, alcoholism is a disease which often exacts large tolls from individuals' familial, social, and occupational lives. A socially stable alcoholic is most likely an alcoholic whose addiction has not completely disrupted his social functioning: That is, he is an alcoholic whose illness is less severe than that of the less socially stable alcoholic. Again, with all psychological therapies, patients who respond best are patients who are the least impaired. The research presented above suggests that the same principle applies to alcoholics. Finally, as Zimberg (1974) suggested, alcoholics with greater social stability are alcoholics who have more to regain or maintain by achieving sobriety. They therefore have more incentive to cooperate with therapies and more motivation to remain abstinent. This greater motivation affords them more favorable prognoses.

Length of treatment involvement. The research on the effects of social stability on length of treatment involvement is considerably less extensive than the research on the effects of this variable on treatment outcome. Gerard and Saenger (1966), who found that high social stability predicted outpatient treatment success, also investigated the effects of social stability on length of stay and number of clinic contacts in outpatient alcoholism treatment. They discovered that high social stability (married, living with family or friends, stably employed) predicted more extensive treatment involvement. Miller et al. (1968) noted that completers of a 90-day V.A. hospital residential program were older and wanted to return to the same living situation, while dropouts had been separated or divorced longer, had shorter

marriages, had more previous admissions, left treatment against medical advice more times in the past, and had more psychiatric and discipline trouble in the service. The authors concluded that dropouts are less stable than completers. Pokorny et al. (1973) deduced that more stable alcoholics (based on variables such as productive work capacity, marital history, social isolation, number of moves, and number of arrests) were more likely to attend at least eight follow-up groups after a 60-day residential program than were less stable alcoholics. Thus, the few times that general social stability has been examined for its effect on length of treatment involvement, it has been found that more stable alcoholics remain in treatment longer or are more likely to complete treatment programs. Kissin et al. (1970), rather than examining extent of treatment involvement, measured whether alcoholics accepted or rejected various forms of treatment when given the opportunity to enter those treatments. They concluded that socially and psychologically stable alcoholics tend to accept outpatient psychotherapy, whereas less stable individuals are more likely to accept inpatient rehabilitation treatment. Combining this finding with Miller et al.'s (1968) conclusion, it seems that socially stable alcoholics tend not to enter residential programs, but those stable subjects who do enlist in such programs tend to remain in them until completing them. Since the two studies involved assessed social stability post hoc based on different conglomerations of variables, additional research is needed to confirm this pattern.

Some research has also been done on the effects of the various components of social stability on extent of treatment involvement. A stable marital situation has been found to predict length of stay in outpatient treatment (e.g., Zax et al., 1961), but has had no apparent

effect on completion of inpatient programs (e.g., Bowen & Androes, 1968). It is speculated that married alcoholics tend to attend outpatient treatment because of pressure from their spouses, while marital status does not affect inpatients' treatment involvement because spouses are not present in inpatients' immediate living situations to exert pressure or provide motivation. A predictive effect of living situation on length of treatment involvement is yet undemonstrated. While Baekeland et al. (1973) concluded that immediate dropouts from an urban alcoholism clinic often lived alone, Pisani and Motanki (1970) found no such effect on persistence in follow-up group therapy. Miller et al. (1968) learned that inpatient program completers wanted to return to their pretreatment living situations (suggesting intact interpersonal relationships), but "with whom living" had no predictive effect. Occupational stability, in addition to predicting treatment success, also appears to predict length of treatment involvement (e.g., Pokorny et al., 1973).

In summary, although the number of studies performed is relatively small, the literature is fairly clear that general social stability and occupational stability predict long treatment involvement for alcoholics. Marital status predicts attendance in outpatient treatment, but it does not have an effect on completion of inpatient programs. Living situation, although a consistent predictor of treatment outcome, has not been a fruitful predictor of extent of treatment involvement in the literature.

Legal Difficulties

Treatment outcome. Amount of legal difficulty may be viewed as a facet of social stability, in that socially stable individuals are

less likely to come into repeated conflict with the law than socially unstable individuals. Amount of legal difficulty is also related to sociopathy, in that criminal activity is often listed as one of the features of the antisocial personality. Since the literature indicates that both social stability (discussed in the previous section) and sociopathy (to be discussed later) can be used to predict alcoholism treatment outcome, it would be expected that amount of legal difficulty would also be significantly related to alcoholism treatment response. In general, the literature is consistent with this deduction.

Positive findings in inpatient settings will be considered first. Trice et al. (1969) found that few or no arrests predicted successful adjustment for alcoholics who went through a state hospital treatment program. However, affiliation with alcoholics anonymous following treatment in the same program was not related to number of pretreatment arrests (Trice & Roman, 1970). McCance and McCance (1969) found that absence of police convictions predicted favorable adjustment after inpatient alcoholism treatment. In a V.A. hospital setting, subjects who were abstinent following treatment had spent less time in jail than subjects who continued to drink heavily (Pokorny et al., 1968). In a hospital setting in England, Davies et al. (1956) learned that criminal activity predicted a poor outcome. In Northern Ireland, legal trouble indicated a poor prognosis for inpatients in a study by Blaney et al. (1975). A poor legal record predicted lack of improvement after inpatient treatment of varying length when investigated by Willems et al. (1973). Edwards et al. (1973), studying alcoholism in the Navy, learned that a history of disciplinary trouble was inversely related to successful service adjustment 3 years after alcoholism

treatment. Ritson (1968) stated that lack of arrests for drunkenness or drunken driving predicted posttreatment abstinence for inpatients, but not for outpatients. However, other authors have found legal involvement to be a significant predictor of outcome for outpatients. In Mindlin's (1959) outpatient population, few arrests predicted favorable outcome. Madden and Kenyon (1975) studied outpatient group therapy for alcoholics and their spouses, and noted that convictions unconnected with drinking and driving predicted continued drinking.

Not all researchers have found degree of legal involvement predictive of alcoholism treatment outcome. In Adamson et al.'s (1974) study, legal involvement was an independent variable which was investigated, but it was not listed as one of the significant predictors of abstinence following inpatient alcoholism treatment in Canada. Kissin et al. (1968) found no predictive effect from number of arrests on posttreatment adjustment across three treatment programs, one of which was inpatient and two of which were outpatient. In another study, number of arrests had no effect on abstinence due to disulfiram treatment by a clinic physician (Baekeland et al., 1971). Orford (1973) excluded abstinent outpatients from his anaylsis, and compared alcoholics whose drinking was controlled with those whose drinking remained uncontrolled. These two groups did not differ with regard to legal history. However, a small sample size and the failure to consider subjects who achieved abstinence weakens the validity of the finding of no effect due to arrest history. In a rather curious finding, Mindlin (1960) found that 11 to 25 arrests was a favorable prognostic sign among chronic court case alcoholics.

In summary, amount of legal involvement has been measured a

variety of ways in the literature, including number of arrests regardless of kind, number of convictions, number of arrests for nondrinking-related offenses, and number of arrests for drinking-related offenses. Regardless of the mode of measurement, the research performed in residential settings has been fairly consistent in showing an extensive criminal history to be associated with poor alcoholism treatment outcome. In outpatient settings, the literature is more equivocal.

Length of treatment involvement. Only three studies were located in which the effect of legal involvement on length of stay in alcoholism treatment was investigated. Pokorny et al. (1973) studied attendance at aftercare outpatient group therapy following inpatient treatment at a V.A. hospital. Patients who attended at least eight follow-up sessions had spent less time in jail than nonattenders. Miller et al. (1968) also examined a V.A. population, and found that discipline trouble while in the service predicted dropping out of inpatient treatment prematurely. Baekeland et al. (1971), however, found that arrest history did not affect length of contact with a disulfiram-prescribing physician. Thus, the literature is suggestive that less legal involvement predicts longer treatment involvement, but more replication is needed.

Age of Onset

Treatment outcome. The predictor variables reviewed thus far have represented aspects of social integration and achievement. The rather strong trends toward better outcomes for older, more stable alcoholics from higher social strata seem to reflect the nonspecific prognostic effect of a strong, stable position in society. But since

alcoholism is the syndrome being treated, one might presume that more specific aspects of the illness itself would have a bearing on prognosis. Attention will now be turned to predictor variables which are related to patients' drinking histories. Age of onset of alcoholism is the first of these variables.

Alcoholics whose drinking problems began relatively late in life are likely to be individuals who achieved more early in their lives than those whose addictions began earlier, and who therefore have more strengths to build on. In addition, having achieved more, they have more to return to and hence more to gain by conquering their addictions. For these reasons, it would be expected that alcoholics whose drinking problems began at a later age would have better prognoses than those whose addictions began earlier. The literature, although not extensive, supports this contention.

Selzer and Holloway (1957), studying a state hospital alcoholic population, found that patients whose drinking problems began before age 25 had poor prognoses. In a ghetto clinic population, Zimberg (1974) discovered that patients who were abstinent at a 1-year follow-up developed their alcohol problems at an older age than unsuccessful patients. Ritson (1968) found that a late age of onset of alcoholism predicted posttreatment abstinence for inpatients, but not for outpatients. Age of onset was unrelated to outcome in studies by Bateman and Petersen (1971) and Pemberton (1967), both of which were conducted in inpatient settings.

Since a late onset of addiction has sometimes been found to predict treatment success, it might also be expected that alcoholics with a shorter duration of addiction would have good prognoses. However, the

literature on this predictor variable is not convincing, and in fact a slight trend in the opposite direction can be seen. Only Orford (1973) found unequivocally that greater posttreatment abstinence was related to a less chronic drinking problem, and the generality of this finding is limited by the fact that patients achieving complete abstinence were excluded from the analysis. Rae (1972) found that treatment successes had a shorter duration of problem drinking, but there was no difference between successes and failures with regard to length of addiction. Baekeland et al. (1971), Madden and Kenyon (1975), and Trice et al. (1969) all found that a longer duration of heavy drinking was associated with treatment success. A broad array of studies was found in which duration of alcoholism was unrelated to outcome (Bateman & Petersen, 1971; Davies et al., 1956; Gibbins & Armstrong, 1957; Gillis & Keet, 1969; Harper & Hickson, 1951; Pemberton, 1967; Rathod et al., 1966; Ritson, 1968; Selzer & Holloway, 1957; Tomsovic, 1970; Vallance, 1965).

The reason for the unexpected unproductiveness of duration of alcoholism as a predictor variable may lie in its interrelatedness with other variables. Rathod et al. (1966) remarked that older alcoholics with long addictions have the best outcome. Selzer and Holloway (1957) stated that young alcoholics with early ages of onset (and therefore short addictions) have poor prognoses. Trice et al. (1969) found treatment success to be related to both a long period of alcoholism and first intoxication occurring at a late age (implying an old chronological age). These three sets of results combine to form a confusing picture when age, age of onset, and duration of problem are considered in combination. As discussed elsewhere in this review,

older age at admission is a favorable prognostic indicator, and, as discussed above, a late age of onset of alcoholism is a positive predictor. Now duration of drinking problem can be derived by subtracting age of onset from age at admission, both of which show better treatment outcomes for higher values. When duration of problem drinking is considered, then, the predictive effects of two other predictor variables work in opposition to one another, and the results are therefore erratic.

Length of treatment involvement. Very little literature was found which addressed the effects of either age of onset of alcoholism or duration of alcoholism on length of treatment involvement. Wilkinson et al. (1971) stated that completers of a 90-day residential alcoholism program began drinking at an older age than dropouts, but Pokorny et al. (1973) found no relationship between age of onset and aftercare attendance following a 60-day V.A. hospital program. Regarding duration of drinking problem, Miller et al. (1968) reported that dropouts from a 90-day V.A. hospital program had longer histories of heavy drinking than completers, but Zax et al. (1961) noted no relationship between duration of drinking problem and number of outpatient clinic visits. These four studies suggest that a late age of onset of alcoholism and a drinking problem of short duration both predict completion of inpatient treatment programs, but that neither of these variables has any effect on attendance in outpatient settings. Additional research is needed to strengthen this conclusion.

Problem Drinking by Patients' Parents

Treatment outcome. A common observation in the study of alcoholism is that the parents of alcoholics were often alcoholics themselves.

A few researchers have investigated whether alcoholics who had alcoholic parents have different prognoses than alcoholics with nonalcoholic parents. Goodwin et al. (1971) found that having a nonalcoholic father predicted remission from alcoholism among convicted male felons. Of course, this is a different population than is found in most alcoholism treatment settings, and in fact no systematic treatment was offered to the alcoholics in Goodwin et al.'s population. The validity of generalizing the finding to alcoholism treatment success is therefore suspect. Trice et al. (1969), examining predictors of adjustment following state hospital alcoholism treatment, found that exposure to alcoholism at a place away from home was a significant predictor of success, but exposure to alcoholism among family members had no predictive effect. These two findings are curious to this reviewer, as the two predictor variables appear to be in fact opposite poles of the same variable. Drinking habits of patients' parents was unrelated to treatment outcome in studies by Goldfried (1969), Rathod et al. (1966), and Ritson (1968). So while the most common finding has been that problem drinking by patients' parents does not predict treatment outcome, two studies hint at a weak effect for alcoholics whose parents were alcoholics to have poor prognoses.

Length of treatment involvement. There is too little literature to permit conclusions about the effect of having had alcoholic parents on alcoholic patients' length of treatment involvement. Baekeland et al. (1973) noted that compared to clinic attenders, slow dropouts were more likely to have a family history of alcoholism. There was no such relationship for immediate or rapid dropouts. Trice and Roman (1970) examined the predictors of posttreatment affiliation with alcoholics

anonymous, and their finding was in the opposite direction from that of Baekeland et al.: Successful A.A. affiliates were likely to have alcoholism in their families of origin. Since the only two studies located which addressed the relationship between problem drinking by patients' parents and length of treatment involvement had conflicting results, no conclusions can be drawn.

Amount of Previous Sobriety

Treatment outcome. It has often been suggested that past behavior is the best predictor of future behavior, and sobriety before alcoholism treatment would therefore be expected to predict abstinence after treatment. In addition, sobriety preceding treatment may be viewed as an aspect of an alcoholic's motivation to stop drinking. And perhaps an alcoholic who was able to stop drinking for a period of time before treatment has a less severe addiction than an alcoholic who has never had a sober period since the onset of his drinking problem. All of these speculations point to the expectation that amount of sobriety preceding alcoholism treatment would predict treatment outcome. The literature reviewed in the following paragraph provides strong support for this hypothesis.

In two out of four outpatient clinics studies, Gilles et al. (1974) found that a greater number of days abstinent during the year preceding treatment predicted improvement on the Alcoholic Involvement Scale at a 12-month follow-up. Mindlin (1960) discovered a trend for alcoholics with previous periods of sobriety to be better adjusted at follow-up than those without previous sober periods. Rossi et al. (1963) found that posthospitalization abstinence could be predicted by at least 6 months of pretreatment sobriety. Baekeland et al.

(1973) established that outpatients' longest abstinent period correlated with percentage of "dry" clinic appointments for dropouts, but not for long-term attenders. That is, the less treatment there was, the better predictor pretreatment abstinence was. Haberman (1966) measured improvement by comparing outpatients' longest sober period in the 2 years before treatment with their longest sober period at follow-up. Despite ceiling effects made possible by this way of assessing outcome, amount of sobriety in the 2 years preceding treatment predicted improvement. Goldfried (1969) discovered that pretreatment abstinence positively predicted posttreatment abstinence, but negatively predicted overall improvement and change in abstinence. He attributed the last finding to ceiling effects. Gertler et al. (1973) stated that continued abstinence in a ghetto clinic population was related to initial abstinence of at least 1 year, but then said that length of longest previous period of sobriety did not predict abstinence. The meaning of these two contradictory statements is not clear. Kurland (1968), using rather vague wording, related that one of the most valuable predictors of treatment success for inpatient alcoholics was a "high sobriety rating".

In summary, significant periods of pretreatment abstinence have generally been found to predict posttreatment abstinence. When improvement in drinking habits has been the outcome criterion, pretreatment sobriety has sometimes been a positive predictor, and has sometimes not been a predictor, due to ceiling effects. Overall adjustment following alcoholism treatment was related to pretreatment periods of sobriety in one of two studies.

Length of treatment involvement. Gertler et al. (1973) noted that length of longest previous period of sobriety predicted continued

attendance at a Boston ghetto alcoholism clinic. Baekeland et al. (1973) categorized their alcoholism clinic patients as attenders, slow dropouts, rapid dropouts, or immediate dropouts. Compared to slow dropouts, attenders had longer periods of abstinence in the 2 years preceding treatment. However, immediate dropouts also had longer abstinent periods than slow dropouts. In Baekeland et al.'s sample, then, there seemed to be a curvilinear relationship between length of longest previous period of sobriety and length of stay in treatment, with long previous abstinent periods predicting immediate dropping out or long attendance, and little previous sobriety predicting intermediate length of stay. In all, more research is needed before conclusions can be drawn about the effect of previous sobriety on length of treatment involvement.

Number of Previous Admissions for Alcoholism

Treatment outcome. It may be argued that if an alcoholic is truly a treatment "success," he should have no need for further treatment. An alcoholic who undergoes a treatment program and subsequently reapplies for admission to treatment, either at the same or another facility, did not benefit from the first treatment. The number of previous admissions for alcoholism treatment an individual has had represents the number of times he has been a treatment "failure," and is thus an index of how difficult he is to treat successfully. Since past behavior generally predicts future behavior of the same type, alcoholics with multiple previous unsuccessful treatment experiences are likely to again fail to benefit from treatment. From this argument, it would be expected that a high number of previous admissions for alcoholism treatment would predict treatment failure. The literature,

although equivocal, is somewhat supportive of this hypothesis.

A major problem in interpreting the literature in this area is determining whether authors are referring to previous admissions to any alcoholism treatment facilities or to their particular facility. Another common problem is lack of differentiation between alcoholic treatment and general psychiatric treatment. Both Davies et al. (1956) and Vallance (1965) found a better prognosis among inpatient alcoholics in the British Isles for first admissions. While this wording suggests that these authors were referring to lack of previous admissions to their hospitals, Davies et al. concluded that a patient who has a good prognosis is one who is seeking help for the first time. Goldfried (1969) noted that among alcoholic outpatients, reopened cases tended not to improve. Apparently he too did not consider previous admissions to other treatment programs. Vogler et al. (1977) discovered that prediction of abstinence after behavioral treatment in a mixed in- and outpatient alcoholic population was augmented by using "number of hospitalizations" as a predictor. It is not clear whether this referred to admissions to their program, to any alcoholism program, to any psychiatric treatment facility, or to any hospital of any type. Blaney et al. (1975) did discriminant function analyses, and found that previous admissions to a given psychiatric hospital and previous admissions to other hospitals differentiated unfavorable from intermediate or favorable outcome for patients in a small alcoholism unit, but <u>not</u> for alcoholics in a large psychiatric hospital (which did not have a special alcoholism unit). No differentiation was made between previous psychiatric treatment and previous alcoholism treatment within psychiatric settings. Similarly, Trice et al. (1969) noted that few or no previous state hospitalizations

was a predictor of adjustment after alcoholism treatment in a state hospital, but there was no attempt to define what disorder was being treated during the previous hospitalizations. Pemberton (1967) specified that one of his independent variables was number of previous admissions to psychiatric hospitals for alcoholism, and made the curious discovery that four or more previous admissions predicted failure for females but predicted success for males. Gillis and Keet's (1969) finding was also contrary to expectations: Readmissions had more favorable prognoses than first admissions. Amount of previous alcoholism treatment was unrelated to success in studies by Baekeland et al. (1971), Ritson (1968), Selzer and Holloway (1957), and Tomsovic (1970), and in two studies by Mindlin (1959; 1960).

In summary, a low number of previous admissions for alcoholism has been found to predict treatment success about as often as it has been found unrelated to outcome. One study demonstrated a better prognosis for alcoholics with more previous treatments, and another study manifested this unusual effect for males while showing the more typical relationship of a better prognosis for those with fewer previous treatments for females. A problem in interpreting the research on this predictor variable lies in authors' frequent failure to differentiate between previous admissions to one specific program, previous admissions to any and all alcoholism treatment programs, and previous general psychiatric admissions. These three variables may measure different things.

Length of treatment involvement. At first glance, previous literature on the relationship between number of previous alcoholism treatments and length of involvement in the current treatment attempt

appears so equivocal as to be meaningless. However, a pattern emerges upon closer inspection. Miller et al. (1968) found that dropouts from a V.A. hospital residential program had more previous admissions to that hospital, and Pokorny et al. (1973) noted that aftercare attenders had spent less time in hospitals than dropouts. Although Zax (1962) found no difference between new and reopened outpatient cases regarding number of clinic contacts, he did learn that repeaters were more likely to have only one contact and were somewhat more likely to have at least three contacts. Thus, there was a curvilinear relationship between previous contact with the clinic and number of sessions attended during this treatment period, with recidivism related to either short or long stay in treatment, and being a first admission related to intermediate length of stay. The credibility of Zax's findings is weakened by his unwarrented manipulation of his data to verify his hypotheses. In other studies, hospitalization rate was unrelated to length of treatment involvement in a ghetto alcoholism clinic (Gertler et al., 1973), in a hospital setting (Ravensborg, 1973), and in disulfiram treatment by a clinic physician (Baekeland et al., 1971). Rubington (1970) found that three or more previous alcoholism treatments predicted residence of over 28 days in a halfway house, and Trice and Roman (1970) noted that persistent A.A. attendance after inpatient treatment was more common in those with a high number of previous hospitalizations.

On the surface, then, two studies showed that previous treatments predicted dropping out of treatment, two studies showed that previous treatments were associated with a long stay in treatment, one study demonstrated a curvilinear relationship between readmission and attendance, and three studies showed no relationship between treatment history and

persistence in present treatment. However, if Zax's (1962) curvilinear finding is disregarded because of his unobjective data manipulation, a pattern emerges: In rather traditional alcoholism treatment settings involving verbal psychotherapy, a high number of previous treatments predicts premature termination, while in nonpsychotherapeutic settings such as A.A. and halfway houses, a high number of previous treatments predicts longer attendance or residence. Perhaps that socially deviant, downtrodden group of individuals who are proven treatment failures find a secure haven in supportive settings such as A.A. and halfway houses, while their poor treatment histories predispose them to avoid the pressures of psychotherapy by aborting treatment.

In keeping with the principle that past behavior predicts future behavior in the same area, one would expect a positive relationship between length of stay in previous treatments and length of stay in present treatment, among those alcoholics who are not currently involved in their very first treatment attempts. There is support for this hypothesis in the research literature (Miller et al., 1968; Zax, 1962).

Previous A.A. Affiliation

Treatment outcome. There are at least three intuitive reasons for expecting pretreatment involvement with alcoholics anonymous (A.A.) to predict posttreatment abstinence and social adjustment. First, A.A. is a resource which is easily and freely available to alcoholics in the community. Those alcoholics who take advantage of this resource are probably those who are most motivated to overcome their drinking problems (Baekeland et al., 1971). Second, past behavior is often the best predictor of future behavior, and alcoholics who attended A.A. prior to therapy would be expected to attend A.A. following therapy.

To the extent that the A.A. support system facilitates sobriety, A.A. attenders would be expected to have a better chance of remaining sober than nonattenders. Third, A.A. attendance is, among other things, involvement in a social network. As such, it may be yet another reflection of social stability, which has been shown to be a powerful predictor of treatment success. The research reviewed below generally confirms that pretreatment A.A. involvement predicts successful treatment outcome, and a speculation can be made regarding the mode of this effect.

Rossi et al. (1963) discovered that abstinence following treatment in a 60-day state hospital residential program was related to at least 7 months of A.A. affiliation prior to treatment. In an outpatient setting, Haberman (1966) established that prior A.A. attendance was a predictor of increased sobriety following weekly analytic group psychotherapy. Again in an outpatient setting, Baekeland et al. (1971) noted that A.A. contact was related to abstinence during disulfiram treatment by a clinic physician. Bateman and Petersen (1971) found a history of regular A.A. attendance predictive of abstinence after treatment in a state hospital residential rehabilitation program. When the same data were analyzed with sex as a moderator variable, a history of regular A.A. attendance predicted abstinence for males, but not for females (Bateman & Petersen, 1972). Ritson (1968) found previous A.A. experience to predict posttreatment abstinence for outpatients but not for inpatients. Kissin et al. (1968) found no predictive effect on overall adjustment from A.A. affiliation across one inpatient and two outpatient programs, and Selzer and Holloway (1957) failed to find pretreatment A.A. contact predictive of posthospitalization adjustment. In summary, previous A.A. attendance has been a consistent

predictor of posttreatment abstinence, but has not been found to predict general social adjustment following alcoholism treatment. This discrepency may be related to the A.A. focus on alcoholism as a self-contained disease entity and relative inattention to problems in other areas of individuals' lives. Carrying the speculation one step further, the predictive effects of previous A.A. involvement, then, seem to be due to either the treatment effects of A.A. on drinking behavior or the correlation of A.A. attendance with motivation for sobriety, rather than to a general socialization or social stability effect.

Length of treatment involvement. Baekeland et al. (1971) found that A.A. contact correlated with length of contact with a disulfiram-prescribing clinic physician, and suggested that A.A. contact was an indirect measure of motivation. In a later study in the same treatment setting, lack of A.A. contact was interpreted as a facet of impulse control (Baekeland et al., 1973). In a finding incongruent with the general trend in the literature, Gertler et al. (1973) noted that outpatient clinic dropouts had greater previous A.A. involvement than attenders. This finding, however, is weakened by a number of methodological flaws in the study.

There is too little research to permit conclusions about the effect of previous A.A. affiliation on length of treatment involvement. No such literature was found which was conducted in inpatient settings, and the present study can make a clear contribution in that regard. In addition, if length of stay in treatment is a reflection of motivation, then the relationship between A.A. involvement and length of stay can provide evidence concerning whether the effect of A.A. attendance on outcome is due to motivation, or to learning which occurs in A.A.

Withdrawal Symptoms

Treatment outcome. A common means of assessing the severity of an individual's physical addiction to alcohol is by noting whether he has experienced alcoholic blackouts or symptoms and syndromes of withdrawal from alcohol (tremors, alcoholic hallucinosis, delirium tremens, or withdrawal seizures). If more severe alcoholism is more difficult to treat, then alcoholics who have experienced withdrawal symptoms would have poorer outcomes.

Orford (1973) found that compared to alcoholics whose drinking was mainly controlled after outpatient treatment, uncontrolled drinkers had reported more tremors, hallucinations, and morning drinking at intake. Orford did not include subjects achieving total abstinence in his analysis. In an inpatient setting, Willems et al. (1973) noted that a history of delirium tremens (D.T.'s) was an unfavorable prognostic sign. Also studying hospital populations, McCance and McCance (1969) observed that absence of D.T.'s predicted remission and adjustment. Following up a prison population for 8 years, Goodwin et al. (1971) learned that good adjustment among alcoholic felons was associated with fewer hallucinations. However, the population in this study was atypical, alcoholic hallucinations were not differentiated from schizophrenic hallucinations, and the presence of hallucinations was assessed at follow-up rather than at intake. On this last point, Goodwin et al. speculated that the "good social adjustment" of which absence of hallucinations was a part was a result of, rather than a cause of, remission from alcoholism.

On the other hand, Baekeland et al. (1971) found that the presence of D.T.'s predicted dry appointments while in outpatient disulfiram

treatment, and Pokorny et al. (1968) stated that more seizures predicted abstinence after treatment in a V.A. hospital. Mindlin did not find severity of reaction to alcoholic bouts to predict success among either outpatients (1959) or inpatients (1960). A history of D.T.'s was unrelated to outcome among alcoholic inpatients in studies by Pemberton (1967) and Rae (1972), and in the latter study, alcoholic hallucinosis was another nonpredictor. Ritson (1968) found no relationship between blackouts or withdrawal symptoms and posttreatment abstinence in a mixed in- and outpatient sample. So, although there is a trend in the literature indicating that a history of withdrawal symptoms portends treatment failure, the finding has been far from unanimous. More research is needed to determine the conditions under which the variable is and is not a significant predictor of treatment outcome, and to account for the occasional findings in the opposite direction.

Length of treatment involvement. There is a great paucity of research on the effect of a history of withdrawal symptoms on length of stay in alcoholism treatment. Pokorny et al. (1973) found that one of the characteristics of those alcoholics who attended at least eight aftercare sessions was less frequent hallucinations or hallucinatory episodes of shorter duration. However, Baekeland et al. (1971) noted that a history of D.T.'s predicted longer contact with an Antabuse-prescribing physician. No conclusions can be drawn on the basis of only two studies, which had conflicting results.

Overall Mental Health

Treatment outcome. Thus far, it has been seen that predictor variables reflecting the nonspecific effects of social integration

strongly affect outcome, and that aspects of patients' alcohol addictions, which would be expected to have more specific effects on treatment outcome, in fact are weaker predictors. Attention will now be turned to a third class of variables: those related to alcoholics' psychological functioning. Since there is considerable overlap between modes of alcoholism treatment and modes of general psychiatric treatment, one might expect personality to affect response to alcoholism treatment. The first personality variable which will be considered refers to patients' general level of psychological well-being versus maladjustment.

"Overall mental health" is a rather difficult variable to define, and is treated here as a composite variable with facets such as general pathology level on psychological tests, ratings of degree of mental illness, ego strength, and history of psychiatric treatment. Since, in general, patients with the best prognoses are those who are the least ill, it could be hypothesized that alcoholics with little indication of psychiatric disturbance would have the best prognoses.

Harper and Hickson (1951) studied inpatient alcoholics in the 1940's, and noted that those diagnosed as having "syntonic" (healthy) personalities had favorable prognoses. Vallance (1965), dealing with inpatients in Glasgow, concluded that a "good previous personality" is a characteristic of alcoholics with favorable prognoses. However, this conclusion was not well justified, and was stated in the discussion section of the article without having been mentioned in the results. Rae (1972) noted that among inpatient alcoholics, failures more often had "disturbed" MMPI profiles than successes. Kissin et al. (1970) examined the characteristics of alcoholics who accept and benefit from several types of treatment, and, based on psychological test results,

concluded that psychologically stable individuals respond well to psychotherapy. Thus far, it has appeared that better personality adjustment is a positive prognostic indicator for alcoholics. However, Pokorny et al. (1968) established that V.A. patients who maintained abstinence at follow-up rated themselves as being more mentally ill and had more neurotic and psychotic symptoms than did heavy drinkers. Similarly, Hedberg et al. (1975) discovered that successes in a behaviorally-oriented outpatient clinic exhibited greater overall psychopathology on the MMPI than did failures, and suggested that greater pathology causes greater motivation, which leads to success. Ego strength, as measured by the MMPI Es special scale, was unrelated to abstinence among attenders at a ghetto alcoholism clinic in a study by Gertler et al. (1973). The effects of general psychological adjustment on alcoholism treatment outcome, then, are not clear from previous research.

When past psychiatric treatment was utilized as an indirect measure of psychological maladjustment, the results were more convincing, although still not unanimous. A difficulty here is similar to a problem encountered in reviewing the literature on previous alcoholism treatment: The distinction between alcoholism treatment and treatment for other psychiatric difficulties is sometimes not clearly made. Haberman (1966) observed that among alcoholics in outpatient group psychotherapy, improved sobriety was negatively related to previous psychotherapy. Previous mental hospital admissions were related to poor adjustment after inpatient alcoholism treatment in South Africa in Gillis and Keet's (1969) study. Trice et al. (1969) observed that few or no previous state hospitalizations was a predictor of success after state hospital alcoholism treatment. Absence of previous

hospitalizations was a strong predictor of success across five residential programs in a study by Bromet et al. (1977). But, Pokorny et al. (1968), in a V.A. setting, noted that alcoholics who achieved abstinence had sought psychiatric treatment more often than those whose addiction remained active. Only extreme groups on the criterion variable were used in this analysis. This latter study stands out as an inexplicable oddity, while the most common finding is that a history of psychiatric treatment is an unfavorable prognostic sign among alcoholics.

Overall mental health appears, from the literature, to be the weakest predictor variable addressed in this review. The findings regarding its effect on treatment outcome have been quite equivocal. When past psychiatric treatment is included as an aspect of overall mental illness, then a slight trend emerges for better adjusted alcoholics to have better prognoses. This conclusion is confounded by many authors' failures to differentiate alcoholism treatment from treatment for other forms of psychiatric disorder.

Length of treatment outcome. As was the case with predicting treatment outcome, a slight but highly equivocal trend toward longer treatment involvement for psychologically healthier alcoholics is seen in the literature. Miller et al. (1968) found that V.A. program dropouts rated themselves as more mentally ill than did completers. In addition, there was a trend toward greater overall pathology on the MMPI predicting dropping out of treatment prematurely. Regarding previous treatment as a measure of mental health/mental illness, Miller et al. found that V.A. hospital dropouts had more psychiatric difficulties while in the service and more previous admissions than completers. Kissin et al. (1970) concluded that psychologically intact alcoholics

accept psychotherapy but reject inpatient rehabilitation treatment. Baekeland et al. (1973) discovered that a large number of psychological and somatic symptoms characterized rapid dropouts from clinic treatment (as opposed to immediate dropouts, slow dropouts, and attenders). McWilliams and Brown (1977) found no relationship between the MMPI Mt (maladjustment) special scale and completion of a state hospital inpatient alcoholism program. The MMPI Es (ego strength) scale was similarly a nonpredictor, as was also the case in Hague et al.'s (1976) study of a V.A. hospital alcoholism unit and Gertler et al.'s (1973) research at a ghetto outpatient clinic. Trice and Roman's (1970) impression of their data was that ego strength was unrelated to affiliation with A.A. following residential treatment. Mozdzierz et al. (1973) scored the MMPI protocols of alcoholic veterans for a special Ad scale, which measures general psychological distress by assessing the symptoms to which a person "admits." The result, contrary to other studies, was that lack of admission of distress predicted leaving treatment against medical advice. This finding could not be accounted for on the basis of level of psychopathology. Thus, the finding seems more a reflection of defensiveness than of actual psychological adjustment.

Ideally, one would hope that more psychiatrically ill alcoholics would remain in treatment longer than their better adjusted counterparts, in order that some of their psychiatric difficulties could be treated. This would even be more important if one subscribes to the medical model position that underlying psychiatric problems cause alcoholism. However, the literature reviewed above suggests that if there is a relationship between mental health and length of stay in treatment,

it is in the opposite direction, such that more poorly adjusted alcoholics are likely to terminate treatment early. This conclusion must be regarded as extremely tentative.

Neurosis

Treatment outcome. Alcoholism constitutes a psychiatric diagnosis in and of itself, and the Alcoholics Anonymous position is that alcoholism is a disease entity. The medical model psychiatric position, however, is that alcoholism is a symptom of an underlying personality disturbance. Many researchers have at least implicitly adopted the underlying personality disorder assumption, as they have categorized alcoholics according to personality or diagnostic type (e.g., neurosis vs. personality disorder vs. psychosis). Just as is the case with psychiatric patients in general, one might posit that the prognoses of alcoholics are related to their personality traits. Now among a general psychiatric population, patients with neurotic diagnoses are generally considered to be more amenable to treatment than those with personality disorders or psychoses, because their maladaptive behavior patterns are less chronic and because they experience greater subjective distress and are therefore more motivated. Among alcoholics, then, a good prognosis would be expected when the underlying personality disturbance is neurotic in nature. The literature reviewed below is generally consistent with this expectation.

Gillis and Keet (1969) found that a neurotic diagnosis predicted adjustment up to 5 years after inpatient alcoholism treatment in South Africa. Pemberton (1967), whose sample consisted of 50 female and 50 male English inpatient alcoholics, found that a diagnosis of neurosis was a positive predictor of abstinence for both sexes. Rae (1972)

found a nonsignificant trend for neurotic alcoholics (as opposed to those with character disorders) to improve with regard to drinking. Neurosis has also been established to be a favorable predictor in studies by Bradfer (1974), Rafaelson (1974), Stanetti (1976), and Tomsovic (1970).

Wallerstein (1957) analyzed the predictors of success in various forms of alcoholism treatment, and discovered that neurotics fared well in conditioned reflex therapy, but that a neurotic diagnosis had no effect on response to Antabuse, group hypnotherapy, or milieu therapy. It should be noted that the small numbers of patients within diagnostic categories may have contributed to the lack of significant findings regarding neurosis. Contrary to the results reviewed in the preceding paragraph, Ritson (1971) found that neurosis was a positive predictor of abstinence among outpatients, but that diagnosis was unrelated to outcome for inpatients. Goodwin et al. (1971) found that neurotic symptoms were unrelated to remission from alcoholism among convicted male felons. However, since this group received no treatment and since, as the authors stated, it represented a different population of "alcoholics" than is found in treatment programs, the finding has limited relevance to the prediction of treatment outcome.

A few investigators have considered neurotic traits in comparison to normal or healthy individuals, and the results have been somewhat different than when neurosis has been contrasted to other diagnostic types. Edwards (1966) found that neuroticism, as measured by the Maudsley Personality Inventory, was negatively correlated with outcome among English inpatients with outpatient follow-up, some of whom were treated with hypnosis. Pokorny et al. (1968), in a V.A. hospital

setting, examined the characteristics of extreme groups in terms of abstinence at follow-up, and found that abstainers had rated themselves as having more neurotic and psychotic symptoms than drinkers. Of course, self-ratings may be more a measure of self-concept or of insight than of actual psychopathology. Neutral ratings of personality were unrelated to outcome, but MMPI profiles suggested that those who achieved abstinence were more neurotic (their Ma and Pd scales tended to be lower and their other clinical scales tended to be higher). Muzekari (1965) observed that "healthy" versus "neurotic" symptomatic behavior in Leary's Interpersonal System of Personality did not differentiate between treatment successes and failures.

In summary, when alcoholics are assumed to have an underlying psychological problem and are categorized according to personality diagnosis, those with neurotic diagnoses have generally been found to have the best prognoses. When degree of neuroticism has been assessed against a background of normalcy, the effects on treatment outcome have been equivocal.

Length of treatment involvement. Very little literature was located which addressed the issue of the effect of neuroticism on length of stay in alcoholism treatment. Wallerstein (1957) observed that although neurotics had no better outcomes than other diagnostic groups after milieu therapy, they did tend to complete treatment. Neuroticism did not affect persistence in Antabuse, conditioned reflex, or group hypnotherapy treatment. Diffendale (1975), using a variety of psychological tests, failed to find neurosis predictive of continuation in aftercare following inpatient alcoholism treatment. Clearly, more research is needed on the effect of neurosis on length of treatment

involvement.

Depression

Treatment outcome. Theoretically, it is difficult to argue for a relationship between depression and alcoholism treatment outcome. The literature, then, will be presented as an empirical investigation, and conclusions will be induced post hoc.

In four studies, a high degree of depression was associated with treatment failure. However, various characteristics of these studies weaken the findings considerably. Caster and Parsons (1977) found increased depression, as measured by the Beck Depression Inventory, to be associated with a poor prognosis for middle-aged male V.A. patients. Outcome, however, was assessed by examining length of stay in treatment and recidivism among follow-up outpatients. Among the recidivist subsample, depression was not related to subsequent success. No systematic attempt was made to assess posttreatment adjustment for the entire sample. Baekeland et al. (1971) noted that absence of depression predicted success in outpatient disulfiram treatment. Unfortunately, depression was measured by noting whether a physician had prescribed antidepressants, and treatment success represented a combination of length of stay in treatment and abstinence while in treatment (no follow-up was performed). Kurland (1968) reported that patients' self-ratings of depression predicted treatment failure while psychiatrists' ratings of patients' depression predicted success. However, Kurland was reporting a poorly documented reanalysis of data from another study, and the results conflicted with those reported in the original study. Goodwin et al. (1971) found that lack of suicide attempts was among the predictors of success for alcoholic felons. No real treatment program

was involved, however; the population was atypical; and the presence of suicide attempts was assessed at follow-up rather than at intake.

A similar relationship between depression and treatment failure was reported in two more methodologically sound studies, but the results were not as strong, and were somewhat in conflict with each other. Wallerstein (1957) found that alcoholics who were depressed responded poorly to outpatient Antabuse treatment, but he reported no relationship between depression and outcome in conditioned reflex treatment, group hypnotherapy, or milieu therapy. In contrast, Ritson (1968) stated that absence of suicide attempts predicted posttreatment abstinence for inpatients, but not for outpatients.

Two studies were located in which the opposite relationship was reported: Depression predicted treatment success. Mindlin (1960), studying "workhouse" inpatients, found that a diagnosis of depressive neurosis predicted improved adjustment up to 3 years after treatment. Gillis and Keet (1969) discovered that South African inpatient alcoholics with depressive diagnoses fared well. The common denominator in these two studies was that diagnosis was used to measure depression. In nonsignificant findings, Mindlin (1959) reported no relationship between mood and improvement in outpatient treatment, Pemberton (1967) did not find suicide attempts to predict abstinence after inpatient psychotherapy, and Adamson et al. (1974) stated that dysphoria failed to affect sobriety 1 year after hospital treatment.

In summary, there are numerous findings which are weak individually but which collectively suggest that depressed alcoholics have poor outcomes, when depression is assessed as a pure variable (i.e., when depression is contrasted only with lack of depression). This conclusion

is in keeping with the principle that patients with more severe psychopathology are more difficult to treat. On the other hand, when depression is measured by noting patients' diagnoses (and hence is contrasted with other forms of psychopathology), depressed alcoholics seem to respond well to treatment. This apparent positive prognosis for depressed alcoholics may be an artifact of the poor prognoses of patients with whom depressives are compared (such as sociopaths and psychotics).

Length of treatment involvement. As was the case with treatment outcome, it is difficult to argue that depression affects length of stay in treatment one way or the other. On one hand, the subjective discomfort which depressed individuals experience may motivate them to remain in treatment, but on the other hand, depressive inertia may sap motivation for treatment. Again, previous literature will be presented empirically, with conclusions then induced.

Trice and Roman (1970) examined the intake characteristics of male state hospital patients who affiliate with A.A. after discharge, and found that lack of depression, both on the MMPI D scale and the Clyde Mood Scale, predicted successful affiliation. In two studies mentioned in the previous section, Caster and Parsons (1977) learned that greater depression was found in treatment dropouts, and Baekeland et al. (1971) noted that antidepressant prescriptions were related to short attendance at an Antabuse clinic. Ravensborg (1973) established that early terminators from a hospital alcoholism program were more downhearted, restless, and worn-out than completers (characteristics somewhat descriptive of depression). However, these results may have been due to chance, and the Clyde Mood Scale was administered too soon after admission to ensure that subjects were adequately detoxified. Miller

et al. (1968) observed that dropouts from a V.A. hospital program were more pessimistic than completers. Baekeland et al. (1973) found that depression was characteristic of immediate dropouts from outpatient alcoholism treatment at a New York City clinic. O'Leary et al. (1977) stated that depression was a variable which improved prediction of completion of a 60-day inpatient program. They failed to specify the direction of the effect. Diffendale (1975) found no relationship between scores on the Depressive Adjective Checklist and continuation in aftercare. Hoy (1969) noted that surgency, a 16PF scale, was inversely related to remaining in inpatient treatment in England. Hoy then noted that surgency is the opposite of depression, and concluded (unlike most other authors) that more depressed alcoholics remain in treatment.

Depression, then, is one of the few predicor variables which has been extensively examined for its effect on length of treatment involvement. The surprisingly consistent result has been that more depressed alcoholics are likely to leave treatment prematurely, which suggests that depressive inertia and withdrawal interfere with the formation of bonds with treatment personnel or with the investment of psychological energy in psychotherapy. The relationship between depression and early treatment termination may not apply to outpatient follow-up after the completion of inpatient treatment. In this case, perhaps the most depressed patients dropped out during the inpatient phase, or perhaps their depression had lifted by the time they were discharged to aftercare. In one study, depression had the opposite effect on length of stay (more depressed individuals completed treatment). However, the researcher in that investigation assessed depression in a rather oblique manner.

Obsessive Compulsive Traits

Treatment outcome. In general, individuals with obsessive compulsive traits are viewed as rigid persons who are resistant to change. The obsessive compulsive neurosis is considered to among the most severe, most difficult to treat neuroses. It has even been considered to occupy a position intermediate between neuroses and psychoses (Kolb, 1973, p. 429). Therefore, it would be expected that alcoholics with obsessive compulsive personality styles are difficult to treat successfully. The literature reviewed below, however, indicates that this is not the case.

Mindlin (1959) learned that outpatient alcoholics with obsessive compulsive neuroses had better prognoses (in terms of overall adjustment) than alcoholics with other diagnoses. In an inpatient setting, the same researcher found a trend toward better posttreatment adjustment for alcoholics with obsessive compulsive neuroses than for those with dissociative neuroses (Mindlin, 1960). Wallerstein (1957) found that a compulsive character style was a particularly strong predictor of success in Antabuse treatment. Machover and Puzzo (1959) noted a trend for remitted alcoholics to exceed unremitted alcoholics in terms of obsessive compulsive traits and overcontrol. Hedberg et al. (1975) found a trend for alcoholics who benefited from treatment at a community mental health center to score high on the MMPI Pt scale. Finally, Trice et al. (1969), examining the psychological characteristics of male alcoholics who were well adjusted following treatment in a state hospital, concluded that rigidity was a favorable prognostic indicator.

That obsessive compulsiveness is a positive prognostic indicator for alcoholics but a negative predictor of success for psychiatric

patients in general suggests that remission from alcoholism is a different process than remission from simple neurosis. On this point, Machover and Puzzo (1959) concluded that remitted alcoholics tend to have tight ego defenses, and went on to say that the price of remission from alcoholism is the great ego effort required to handle unresolved problems. O'Leary et al. (1977) concluded that the most effective way to treat alcoholics is to build their defenses rather than try to modify their defensive styles. Gerard and Saenger (1966), qualitatively analyzing their data, noted that recovery from alcoholism involved changes in social behavior but not in psychological conflicts, and suggested that optimally effective alcoholism treatment should not attempt personality change. So it appears that while treatment of neurosis involves tearing down maladaptive defenses, recovery from alcoholism is a process of tightening already-existent defenses. Obsessive compulsives, with their rigid defensive structures, are ideally suited for this process.

Length of treatment involvement. Only one study was located in which the effect of obsessive compulsive traits on length of treatment involvement was addressed. Hoffmann and Jansen (1973) found that alcoholics hospitalized 16 to 31 days were the most compulsive (as measured by the MMPI Pt sacle), while those hospitalized 46 to 59 days were the least compulsive. This finding suggests that obsessive compulsiveness leads to premature treatment termination, although replication is needed. It could be speculated that the length of time obsessive compulsive alcoholics remain in treatment depends on the degree to which the type of treatment offered threatens their defenses.

Antisocial Personality

Treatment outcome. According to clinical psychiatric and psychological lore, the disorders grouped under the generic diagnostic category "personality disorders" and, in particular, the antisocial (psychopathic, sociopathic) personality are among the more difficult psychiatric disorders to treat. If the medical model assumption is made that alcoholism reflects an underlying personality disturbance, then personality-disordered (especially antisocial) alcoholics would be expected to be quite refractory to treatment. The literature presented in the following paragraphs indicates that this in fact has been the case in previous research.

Personality disorder as a broad category of diagnosis will be considered first. Researchers have generally differentiated personality disordered alcoholics from those with neurotic character structures. Some authors have opted for a tripartite scheme of personality disorders, neuroses, and psychoses. Davies et al. (1956) found that within their English hospital inpatient population, alcoholics with personality disorders had poor prognoses. Unfavorable outcomes for personality-disordered alcoholics were also found by Rafaelson (1974) and by Stanetti (1976). Ritson (1968) found posttreatment abstinence related to mild or moderate (as opposed to severe) personality disorder for outpatients, but not for inpatients. In a later article by the same author, moderate or severe personality disorder (as opposed to neurosis or mild personality disorder) was a favorable prognostic sign for outpatients, but again not for inpatients (Ritson, 1971). Rae (1972) found a trend toward a worse prognosis for personality-disordered alcoholics than for neurotic alcoholics.

Antisocial personality, a specific type of personality disorder, has been measured four ways in the alcoholism treatment prediction literature: with psychological tests, according to diagnosis, by history, and by general impression. Psychological testing has been the most frequent means of assessing sociopathy, and the most commonly used psychological test score has been the MMPI Pd (psychopathic deviate) scale. Trice et al. (1969) found that a low Pd score was among the predictors of success among male alcoholics in a state hospital. In a community mental health center alcoholic population, failure at a 6-month follow-up was related to a high Pd score. Rae (1972) did not find a main effect for patients' Pd scale scores, but he did find a significant interaction between the Pd scores of alcoholic inpatients and their wives which affected posttreatment abstinence. Specifically, nonpsychopathic patients with nonpsychopathic wives had the best prognoses (a 75% success rate), followed by psychopathic patients with nonpsychopathic wives, nonpsychopathic patients with psychopathic wives, and psychopathic patients with psychopathic wives (only a 20% success rate). Pokorny et al. (1968) found a trend toward a better prognosis for inpatient veteran alcoholics with low Pd scales. In a rare nonsignificant finding, Muzekari (1965) found no predictive effect from the MMPI Pd scale or any other MMPI scales. Tomsovic (1970) analyzed the MMPI profile code types rather than scores on individual scales of the test. He found a trend toward a poor prognosis for sociopaths (code types 4-9 and 9-4) in his V.A. hospital inpatient alcoholic population. Caster and Parsons (1977) assessed sociopathy by administering the Lexington Addiction Research Scale for Psychopathy, and discovered a trend toward less recidivism for V.A. alcoholic

inpatients who had lower sociopathy scores. There was an interaction between sociopathy and locus of control in that study, in that sociopaths had particularly high recividism rates if they perceived themselves as being controlled by chance. Within a recidivist group, sociopathy had no effect on further recidivism.

Another common way of defining sociopathy is by diagnosis. Gillis and Keet (1969) followed up former inpatient alcoholics for up to 5 years, and found that those who had been diagnosed as psychopaths did poorly on a broad spectrum outcome measure. In Mindlin's (1959) outpatient population of alcoholics, antisocial personality and dyssocial personality were among the diagnoses which were associated with poor outcomes. In another study by the same author, there was a trend toward a poor prognosis for alcoholics with sociopathic diagnoses among chronic "skid row" court case alcoholics in a "workhouse" inpatient program (Mindlin, 1960). Wallerstein (1957) examined prognostic indicators across four treatment modalities, and found that antisocial alcoholics did not respond well to conditioned reflex treatment. He did not mention sociopathy as a significant prognostic indicator for Antabuse, hypnotherapy, or milieu therapy. A poor prognosis for sociopathic alcoholics was also found by Bradfer (1974). In all of the studies mentioned so far in which alcoholics with antisocial personalities have fared poorly, multifaceted outcome measures have been used. That is, abstinence was not the sole criterion for success: Occupational, residential, interpersonal, and social posttreatment adjustment had also been considered. From the general psychiatric literature, it is already known that psychological treatment is generally unsuccessful in improving the social, interpersonal, and occupational adjustment of

psychopaths. In order for the alcoholism literature to add anything new, it must demonstrate that treatment of psychopathic alcoholics is unsuccessful in bringing about abstinence. Harper and Hickson (1951) found just that. Follow-ups of 2 to 5 years on discharged inpatient alcoholics revealed that psychopaths generally failed to achieve abstinence or moderate drinking.

In another study in which abstinence was the sole outcome criterion, Glatt (1961) assessed psychopathy by a combination of historical information and patients' in-hospital behavior. In this study, the strongest predictor of drinking relapses among former English public mental hospital patients was psychopathy. Rathod et al. (1966) established that male inpatient alcoholics with histories of antisocial behavior had poor prognoses. Ritson (1971), based on data from a scale of hostility and clinical assessments of personality, concluded that "severe psychopaths" and "impulsive actor's out" are the least likely alcoholics to achieve sobriety.

Two studies were found in the literature in which antisocial personality was not related to treatment failure, but both of the studies had methodological weaknesses. Hoffman and Jansen (1973) found a curvilinear relationship between the MMPI Pd scale and improvement among male alcoholic inpatients, with high Pd scores associated with much improvement or no improvement and low Pd scores associated with minimal or moderate improvement. However, improvement was rated at discharge: No follow-up was conducted to assess posttreatment abstinence or overall adjustment. Goodwin et al. (1971) found sociopathic symptoms unrelated to remission from alcoholism. However, they studied a different population (convicted male felons), there

was no treatment program involved, and sociopathy was assessed at follow-up rather than at conviction to prison. With the exception of these two rather weak findings, the literature overwhelmingly demonstrates that personality disordered alcoholics, especially those with antisocial personalities, are unlikely to be abstinent or to make adequate social adjustments following either inpatient or outpatient alcoholism treatment.

Length of treatment involvement. As is the case with most predictor variables, the effect of sociopathy on length of treatment involvement has not been investigated nearly so extensively as its effect on treatment outcome. Huber and Danahy (1975) found that dropouts from a 90-day V.A. hospital alcoholism program scored significantly higher on the MMPI Pd scale than completers of the program did. Hoffman and Jansen (1973) discovered that high Pd scores were common among alcoholic inpatients who took the initiative for their own discharge (as opposed to those who left with medical advice). Miller et al. (1968) found a nonsignificant trend toward higher Pd scores among dropouts from a V.A. hospital inpatient program than among completers of the program. However, the MMPI Pd scale did not predict dropping out of treatment in studies of state hospital alcoholics by Krasnoff (1976) and McWilliams and Brown (1977), and in a V.A. hospital setting by Hague et al. (1976). Thus, the MMPI measure of psychopathy has not been as consistent a predictor of premature treatment termination as of treatment failure. A weak but intriguing finding regarding the effect of personality disturbance on dropping out of treatment was made by Orford (1974). He noted that simplistic, "black and white" perceptions of other people are among the characteristics of personality disorders. Orford

found a trend for English alcoholics who think simplistically about others to have short stays in a halfway house. This finding suggests that personality disordered alcoholics do not stay in treatment long, although replication is certainly needed because of the marginal significance level, the unusual population, and the indirect measure of personality disturbance.

Anger and Aggression

Treatment outcome. The author has observed that a common stereotype of alcoholics which is held by treatment staff is that they are a characterologically angry group of individuals. A trend emerges from the prediction literature that angrier alcoholics are less likely to recover than their less aggressive counterparts. This trend is not surprising when one considers that characterological anger is often thought to be an aspect of many forms of personality disorder, including the antisocial personality, and of an extensive arrest history, both of which are predictors of treatment failure.

Ritson (1971) administered the Hostility Scale to a group of half inpatient and half outpatient alcoholics, and found that low hostility portended a high likelihood of abstinence at a 1-year follow-up. Orford et al. (1976) factor analyzed various aspects of male alcoholic outpatients' marital relationships, and found a trend for high scores on the factor labeled "expressed hostile dominance and failure to express affection" to predict poor or equivocal outcomes with regard to drinking over a 12-month period. Kurland (1968) reported that low aggressiveness, assessed by the Clyde Mood Scale, was among the significant predictors of adjustment 2 years after inpatient alcoholism treatment, and Trice and Roman (1970), using the same data base, noted

that aggressiveness predicted posttreatment affiliation with A.A. Wallerstein (1957), studying alcoholics in four types of treatment, arrived at the general conclusion that aggressive patients do poorly, and found more specifically that alcoholics diagnosed as "aggressive personality" did not respond well to conditioned reflex therapy. In nonsignificant findings, Pokorny et al. (1971) found no relationship between a factor called "aggressive-outgoing" and alcoholism treatment success, and Baekeland et al. (1971) did not find that impulse control (assaultiveness and arrests) affected response to disulfiram treatment. Adamson et al. (1974) noted that neither an "angry potency" nor an "angry withdrawal" factor predicted abstinence following inpatient treatment.

Length of treatment involvement. Although the literature reviewed above indicates a fairly consistent trend for angry alcoholics to have poor treatment outcomes, the literature reviewed below does not reveal any consistent trend for anger to predict length of treatment involvement. A few authors have found anger-related variables to predict length of treatment involvement. Miller et al. (1968) learned that alcoholics who rated themselves as hostile and tending to lose control of hostility were likely to drop out of a V.A. hospital program prematurely. Wallerstein (1957) reported that alcoholics with strong aggressive tendencies generally failed to complete conditioned reflex treatment, and speculated that this form of treatment was threatening to them. In a related finding, Ravensborg (1973) noted that early terminators of an A.A.-oriented inpatient unit were less good-natured (measured by the Clyde Mood Scale) than completers. However, not all findings have been in the direction of less hostility predicting longer treatment

involvement. Fitzgerald et al. (1967) found a positive correlation between aggression (measured by the Edwards Personal Preference Test) and completion of a state hospital alcoholism program. Cohen et al. (Note 4) stated that drug addicts who completed aftercare treatment were low on the "aggression" scale of the Personality Research Form, while alcoholics who completed treatment were high on aggression. Finally, Diffendale (1975) found no relationship between hostility (measured with the Famous Saying Test) and continuation in aftercare. So while it might be expected that angry alcoholics would be more likely to have their defenses threatened by therapy or become angry at treatment staff and therefore leave treatment prematurely, previous research has not been consistent in demonstrating a predictive effect of anger on length of treatment involvement.

Schizophrenia

Treatment outcome. As was the case with antisocial patients, schizophrenics as a group are often considered difficult to treat successfully. The breakdown in logical thinking which is characteristic of schizophrenia would seem to undermine the effectiveness of both verbal psychotherapy and didactic alcoholism counseling with this group. One form of treatment with some demonstrated effectiveness in treating schizophrenia is antipsychotic medication, yet chronic use of medication is counter to the A.A. emphasis on total abstinence from all drugs. For these reasons, one would not expect the prognosis of the schizophrenic alcoholic to be favorable. In general, the literature supports this deduction.

In inpatient settings, Gillis and Keet (1969) observed that among diagnostic subtypes of alcoholics, psychotics had poor overall outcomes,

and Pemberton (1967) found that for both female and male alcoholics, those with psychotic etiology were not likely to achieve abstinence. In outpatient populations, Mindlin (1959) discovered that schizophrenia was among the diagnoses associated with poor adjustment, and Heilbrun (1971) found that a low score on the MMPI Sc scale (a measure of schizophrenia) was among the predictors of improvement (as rated by counselors at discharge). Wallerstein (1957) analyzed predictors of success in different types of alcoholism treatment, and found that latent schizophrenics did poorly in Antabuse treatment and schizophrenics did poorly in group psychotherapy. However, schizophrenics fared well in conditioned reflex therapy. Wallerstein concluded that Antabuse can precipitate psychotic decompensation when given to latent schizophrenics. The reason for the positive response of schizophrenic alcoholics to conditioned reflex therapy was not clear in Wallerstein's book, but may be related to the general tenet that behavior therapy is most effective with patients whose overall level of functioning is low. Ritson (1971) did separate analyses for inpatients and outpatients, and learned that personality type was unrelated to outcome for inpatients, while among outpatients, psychotics were not among the alcoholics with good prognoses. Tomsovic (1970), in a V.A. hospital setting, noted that the prognosis was not much worse for schizophrenics than for non-schizophrenic alcoholics. In a rather curious finding, Rossi et al. (1963) stated that a diagnosis of functional psychosis in addition to alcoholism predicted sobriety after treatment in a state hospital alcoholism program. They suggested that psychotic alcoholics are not "true" alcoholics and therefore have better prognoses. The reason for their finding, which is contrary to the usual relationship between

schizophrenia and alcoholism treatment outcome, is not clear. In summary, the general trend in previous literature is for alcoholics who also have schizophrenic illnesses to have poor outcomes following treatment. This relationship may not hold true for behavioral treatment of alcoholism.

Length of treatment involvement. The literature on the effect of having a schizophrenic illness on alcoholics' length of stay in treatment is rather scant and indirect, but is suggestive that schizophrenic alcoholics leave treatment early. Heilbrun (1971) found that a low MMPI Sc score was one of four predictors of time spent in outpatient alcoholism treatment. Miller et al. (1968) observed that on the Holtzman Inkblot Test, dropouts from inpatient alcoholism treatment have weak ego boundaries and lower F+ percentages (two psychological test indicators of schizophrenia). Pokorny et al. (1973) noted that good reality testing (a characteristic of a nonpsychotic individual) predicted attendance at eight or more outpatient follow-up group sessions after a 60-day residential alcoholism program. That schizophrenic signs and symptoms predict premature termination from alcoholism treatment is not surprising, in that denial of psychological problems is often characteristic of schizophrenia, and denial of problems is not conducive to extensive involvement in treatment.

Intelligence

Treatment outcome. As part of the principle that the individuals who benefit most from psychological treatment are those with the most strengths, it would be expected that intelligent alcoholics would have better prognoses than unintelligent alcoholics. There are many findings

in the literature which are consistent with this deduction. Glatt (1961) found that a high IQ predicted a lack of drinking relapses among English inpatients. In an outpatient setting, Mindlin (1959) discovered that high intelligence predicted posttreatment adjustment. Upon cross validation, very superior intelligence remained a predictor of treatment success, while below average IQ remained a predictor of failure. Heilbrun (1971) found that an IQ of at least 103 was among the predictors of counselors' global outcome ratings of outpatient alcoholics, and Kurland (1968) noted that an IQ of at least 115 was a valuable predictor of adjustment following a state hospital alcoholism program. Using a different cut-off point, Rossi et al. (1963) observed that an IQ of 81 or more predicted abstinence after treatment in a state hospital alcoholism unit.

Kissin et al. (1968) found that the subtests of the Wechsler Adult Intelligence Scale (WAIS) which are most highly related to overall IQ (Vocabulary, Picture Completion, Digit Span, Arithmetic, and Comprehension) were positively predictive of posttreatment abstinence and adjustment across one inpatient unit and two outpatient units. When the data were analyzed separately for each of these treatment facilities, it was found that high verbal intelligence predicted success in an inpatient rehabilitation program but not in outpatient medication or psychotherapy treatment, and high nonverbal IQ predicted success in psychotherapy or inpatient rehabilitation and failure in medication treatment. When both intelligence and social stability were examined, it seemed that intelligent, socially intact alcoholics responded best to outpatient psychotherapy; intelligent, socially unstable alcoholics were best suited for inpatient rehabilitation treatment; and unintelligent,

socially stable persons had the best prognoses in pharmacological therapy (Kissin et al., 1970). This breakdown of results suggests that the predictive effect of intelligence is due to the fact that verbal psychotherapies require patients to be of at least average intelligence. Pemberton's (1967) conclusion is not inconsistent with this deduction about the mechanism by which intelligence affects alcoholism treatment outcome. His finding, significant for males and a trend for females, was that intelligence level per se is not relevant to outcome, but rather that the absence of intellectual deficit predicts abstinence following inpatient psychotherapy. While Pemberton found that intelligence was a stronger predictor of outcome for male alcoholics than for females, Bateman and Petersen (1972) found that high IQ predicted abstinence for female inpatients but not for males. Tomsovic (1974) noted that high IQ was related to improvement for binge drinkers, but not for continuous drinkers. Machover and Puzzo (1959) did not study treatment response longitudinally, but rather did a static analysis of the characteristics of remitted and unremitted alcoholics. These two groups were nearly equal with regard to overall IQ, but when WAIS subtests were examined, it was found that remitted alcoholics were higher on the Arithmetic and Block Design subtests while unremitted alcoholics were higher on Digit Span and Object Assembly. The authors' interpretation of these findings was that remitted alcoholics fared well on active tasks while unremitted alcoholics performed better on passive tasks. Intelligence had no effect on treatment outcome in studies by Davies et al. (1956), Edwards (1966), Kish and Hermann (1971), Pokorny et al. (1968), and Trice et al. (1969).

In summary, there is a nonunanimous but nonetheless significant

trend in the literature for intelligence to be positively related to alcoholism treatment outcome. There is some indirect suggestion that the reason for this relationship is that the verbal therapies which are often employed in the treatment of alcoholism require that patients have at least average intelligence and verbal skills in order to be effective.

Length of treatment involvement. The literature does not reveal any real trend for alcoholics' intelligence to affect their length of stay in treatment. In inpatient V.A. hospital settings, Miller et al. (1968) found no effect from IQ on program completion, Hague et al. (1976) noted that intellectual ability did not affect length of stay in or completion of a 2-month program, and Wilkinson et al. (1971) found no relationship between Shipley IQ and completion of a 90-day program. Orford (1974) stated that IQ did not significantly affect length of stay in a London halfway house. The only significant finding was by Heilbrun (1971), who noted that an IQ of at least 103 was among the useful predictors of time in an outpatient program for chronic court-case alcoholics. Heilbrun, however, entered IQ into a prediction equation based on "plus" and "minus" ratings on four predictor variables, without statistically testing the significance of the effect of IQ on length of stay in treatment.

Defensiveness and Denial

Treatment outcome. In general, defensiveness and denial of problems are considered obstacles in the way of successful psychological treatment. The literature suggests that this generalization applies to the treatment of alcoholism. Gillis and Keet (1969) found that inpatients at a

short-term alcoholism treatment unit who were clinically judged to be low on "denial" had good prognoses. Hedberg et al. (1975) discovered that alcoholics who benefited from behaviorally oriented alcoholism treatment at a community mental health center scored lower on the MMPI L scale (a measure of simplistic, naive denial of psychological problems) than those who were treatment failures. Hoffman and Jansen (1973) noted that ratings of improvement at discharge for hospitalized alcoholics were related to low MMPI L scale scores. In a nonsignificant result, McWilliams and Brown (1977) failed to find a relationship between a special MMPI scale measuring social desirability and inpatient treatment outcome. As a whole, these findings indicate that alcoholics must enter treatment without excessive defensiveness or denial in order to benefit. It might be speculated that motivation is involved in this relationship: That is, in order to be motivated to achieve abstinence and improve their adjustment, alcoholics must be willing to admit that they have problems.

While alcoholics must enter treatment without excessive denial in order to improve, a finding by Cripe (1975) suggests that successful treatment is a process in which defensiveness increases. Cripe administered the MMPI to male alcoholics at admission and discharge and found that those who were successfully adjusted at an 18-month follow-up showed significant increases on the MMPI K scale during the course of treatment. This finding may mean that successful treatment seemed to build the defenses of these individuals. However, it has also been suggested that the K scale measures the degree to which individuals realistically feel good about themselves (Duckworth & Duckworth, 1975, p. 29). Cripe's finding may simply mean that alcoholics who are well

adjusted at follow-up are those whose self-concepts improve while they are in treatment.

Length of treatment involvement. Although it would be expected that denying, defensive alcoholics would leave treatment early because of their failure to admit to problems requiring treatment, the literature on this issue is equivocal. Perhaps the most defensive, denying alcoholics fail to even seek treatment. Nelson and Hoffman (1972) found that early treatment terminators (in an inpatient setting) engaged in more repression and defensiveness and reported fewer psychiatric complaints than those who remained in treatment at least 12 days. They concluded that early terminators deny more, are therefore in less subjective distress, and consequently leave treatment prematurely. However, their subjects were not fully detoxified when testing was performed, which casts doubt on the validity of the predictor variables. Using MMPI scales and special scales, Mozdzierz et al. (1973) reported that inpatient alcoholics who leave treatment against medical advice tended to deny problems, be more defensive, and deny general psychological distress. They noted that these findings could not be accounted for on the basis of different pathology levels between completers and dropouts. While the two studies just reviewed found that defensiveness predicted early treatment termination, two other studies found the opposite effect. Krasnoff (1976) noted that completers of a 6-week state hospital alcoholism program scored higher than dropouts on the MMPI L scale. Hoffman and Jansen (1973) observed that a longer stay in treatment was associated with a high L scale score. In four studies, measures associated with defensiveness were unrelated to length of treatment involvement. Krasnoff (1977) found no relationship between

treatment completion and MMPI special scales measuring denial and admission; McWilliams and Brown (1977) found that an MMPI measure of social desirability failed to discriminate between treatment completers, near-completers, and elopers; Hague et al. (1976) reported that neither the MMPI Social Desirability special scale nor the F - K index (a measure of faking good vs. faking bad) predicted program completion; and Ravensborg (1973), using a rather unsophisticated measure of denial, failed to find any difference between completers and early terminators of an A.A.-oriented program on general denial or defensiveness. In the latter study, the subjects may not have been thoroughly detoxified when tested.

In summary, no consistent relationship between defensiveness and length of treatment involvement emerges from the alcoholism literature. While admission of problems seems to be a prerequisite for successful treatment of alcoholism, it does not appear to affect length of stay in treatment.

Prediction Equations

The presentation up to this point has focused on the effects of individual predictor variables on alcoholism treatment outcome and length of treatment involvement. However, most authors have not researched only one predictor variable, but rather have investigated the effects of a number of intake variables on outcome and/or length of stay. Some of these authors have confined themselves to separate univariate analyses of the effects of various individual predictor variables. Others have used statistical techniques such as multiple regression and discriminant analysis to combine several independent variables into prediction equations. This approach has obvious pragmatic

advantages, as it allows the practical application of research results in selecting patients for treatment. In addition, Trice and Roman (1970) argued for multiple regression analysis of predictors because such analyses allow the specification of the relative strength and significance of various predictors. Unfortunately, meaningful comparison of different authors' prediction equations is difficult, because the variables in an author's formula are determined to a great extent by the variables which he chose to measure, which in turn are affected by such unsystematic factors as which data happened to be available and the author's personal interests, beliefs, and biases. With this rather discouraging caution in mind, the multivariate prediction literature on alcoholism treatment outcome, and then on length of treatment involvement, is presented below.

Treatment outcome. The studies reported in this section, in which multivariate formulae were devised to predict alcoholism treatment outcome, vary with regard to treatment setting, predictor variables selected for study, criterion measure, and statistical model. Trice et al. (1969) examined the demographic and psychological characteristics of male state hospital alcoholics who were rated as sober, occupationally adjusted, and ecologically adjusted at a mean follow-up time of 28.5 months after treatment. Using a multiple regression analysis, 33% of the variance in the criterion variable could be accounted for by employing 15 predictor variables, 8 of which were demographic and 7 of which were psychological.[1] The demographic variables, which accounted for 24%

[1]In actuality, Trice et al. (1969) reported 16 significant predictor variables. However, one of them, low visibility to community referral agencies after treatment, is not a valuable predictor of treatment outcome because it cannot be assessed at admission.

of the outcome variance, were (1) few or no arrests, (2) skilled, white collar, or professional occupation, (3) few or no previous state hospitalizations, (4) first or second generation parent, (5) longer period of alcoholism, (6) first intoxication at a later age, (7) small number of siblings, and (8) exposure to alcoholism at a place away from home. The psychological variables were (1) internally apprehensive of social interaction, (2) self-blame, but presents self to others as outgoing and happy, (3) naive, sentimental, gregarious, with simple tastes, (4) socially unskilled, (5) lacks insight, (6) trusts accepted values, and (7) low MMPI Pd scale (not antisocial).

Adamson et al. (1974) did a discriminant function analysis to predict abstinence 1 year after treatment in an inpatient alcoholism program in Winnipeg. The analysis, which utilized 30 variables from motivation and mood checklists, completely differentiated abstainers from drinkers, and was significant at the .001 level. The sample size, however, was small, as follow-up data were gathered on only 38 subjects. The high ratio of predictor variables to subjects points to the need for replication. Edwards (1966) did a 1-year follow-up on inpatient alcoholics at a British hospital, rating drinking and its consequences during each month of the follow-up year and then summing the results for the full year. Half of the patients received standard medical, milieu, and activities treatment, while the other half had the standard treatment regimen supplimented with hypnosis. A multiple r of .606 was obtained when extraversion, neuroticism, and social stability were used in a prediction equation; an r of .604 resulted from using only neuroticism and social stability; and the r was .541 for social stability alone. The patient with the best prognosis was socially stable,

extraverted, and not neurotic. Only these three predictor variables were analyzed, so it is not known whether the addition of other variables would have improved the prediction. Blaney et al. (1975) performed a 6-month follow-up across two alcoholism treatment settings, using a combination of amount of drinking and improvement in drinking to assess outcome. For a small alcoholism unit, a discriminant function analysis revealed only two useful predictors, which explained 7.5% of the variance in outcome: previous admissions to a psychiatric hospital, and previous admissions to other hospitals. For a large psychiatric hospital, the only significant discriminator was legal trouble, accounting for 8% of the criterion variance. The probability of misclassification in this latter setting was .387. These disappointing results emerged despite the fact that a broad array of variables was entered into the analyses. Perhaps the unorthodox outcome measure, which consisted of a combination of an absolute score and a change score, affected the findings. Willems et al. (1973) stated that they could accurately predict improvement for 82% of inpatients, but failed to specify their method of prediction.

Bromet et al. (1977) performed a complex, careful analysis of the effects of five forms of residential treatment to determine the relative effects of patient characteristics and treatment characteristics on outcome. Nine different outcome measures were employed, with separate analyses for each: alcohol consumption, behavioral impairment, physical impairment, subjective rating of drinking problem, previous hospitalizations, drinking pattern, occupational functioning, social functioning, and psychological well-being. Using an array of demographic variables and intake values of the nine criterion variables as predictors,

the total variance accounted for by regression equations ranged from 15% to 33%, depending on which outcome variable was employed. Program characteristics accounted for 1.5% to 3.8% of the variance in outcome, and 50% to 80% of the outcome variance was left unexplained. Cronkite and Moos (1978) argued that Bromet et al.'s estimates of the effects of patient characteristics were inflated by the fact that those variables entered first into regression equations receive undue credit for shared variance. Cronkite and Moos reanalyzed Bromet et al.'s data using a path analysis model. Overall, 18% to 27% of the variance in outcome could be accounted for, and 12% to 61% of this explained variance could be attributed to patient characteristics. Symptom variables assessed at intake had direct effects upon outcome, while the effects of demographic variables were mediated by treatment program characteristics. These two studies are scientifically intriguing, but somewhat lacking in practical applications.

Vogler et al. (1977) examined "wet" and "dry" in- and outpatient alcoholism treatment. While treatment type did not affect abstinence at an 18-month follow-up, patient characteristics did. For pre- to posttreatment change in abstinence, a multiple r of .80 was obtained by entering pretreatment alcohol intake, number of hospitalizations, number of jobs lost due to alcoholism, and socioeconomic status as predictors. When abstinence at follow-up was the criterion, a multiple r of .54 resulted from using pretreatment alcohol intake, number of jobs lost due to drinking, education, and days per month lost from work due to alcoholism as predictors. A discriminant analysis revealed that five predictor variables differentiated between abstinent, controlled, and relapsed outcome categories: duration of drinking problem,

pretreatment alcohol intake, days per month lost from work, education, and age. Using these five variables, 63% of subjects were correctly categorized. Personality variables were not useful predictors.

Turning now to outpatient settings, Mindlin (1959) developed a prognostic index for improved overall adjustment. There were four social predictor variables (marital status, socioeconomic status, occupation, and arrest history) and four psychological predictor variables (motivation, IQ, diagnosis, and Rorschach variables). By assigning weights to these predictors according to the statistical significance levels of their relationships with outcome, a predictive index was developed which correctly labeled 84% of the 46 subjects in the original sample regarding their outcomes. When the index was cross-validated on a sample of 60 subjects, 80% were correctly classified. Certain values of some of the predictor variables failed to retain significance. The predictors which remained valid were: married, separated, or divorced; three categories of economic resources; occupation; fewer than 5 versus more than 20 arrests; good versus poor motivation; Rorschach balance; and diagnosis of obsessive compulsive versus organic brain syndrome or sociopathy.

Heilbrun (1971) devised a simpler prediction system in which a "plus" was assigned for each of the following: at least 12 years of education, IQ of at least 103, MMPI Sc scale score of 59 or less, and MMPI Ma scale score of 53 or less. Among chronic court case outpatients, the number of "pluses" in this system was related to global outcome rating by counselors at discharge at the .001 level of significance. The study is weakened by the lack of a follow-up. Finally, Hedberg et al. (1975) investigated the utility of the MMPI for predicting

drinking behavior 6 months after behavioral alcoholism treatment. A step-wise discriminant analysis was used to derive a linear equation to predict success versus failure. The equation, which utilized the L scale measured at admission and the Pa scale assessed halfway through treatment, correctly classified 73% of the failures and 71% of the successes. Drawbacks of the study are that one of the predictors was not assessed at admission, no social variables were examined as potential predictors, and the sample was small.

In summary, researchers seeking to derive multivariate prediction equations have entered widely differing types and numbers of variables into their analyses. The number of predictor variables in their resulting equations has ranged from 2 to 30, with the median number of predictor variables in the studies reviewed being about eight. Various statistical techniques have been employed, including multiple regression, discriminant function analysis, and simple weighting schemes. Multiple regression analyses have typically yielded multiple correlation coefficients of approximately .60, with up to one third of the variance in treatment outcome being accounted for by the predictor variables. Attempts to classify patients into categories of outcome based on prediction equations have generally resulted in correct classification in about 80% of cases. When tests of statistical significance have been performed, the relationship between prediction scores and outcome measures has been significant at the .001 level.

The statistical significance of multivariate prediction equations, then, has been fairly well established. The practical significance of the formulae is a matter of opinion. It seems likely that a selection procedure based on such a formula would be more valid and sytematic

than the haphazard clinical selection processes which are generally employed. However, errors would occur in about 20% of cases: Some patients accepted for treatment would fail to benefit, and some turned down would have benefited had they been accepted. It would be of tremendous interest and importance to assess predictor variables on all applicants to treatment programs, including those who are rejected, and obtain follow-up information on untreated alcoholics, to determine the fate of untreated alcoholics with both good and bad prognoses based on prediction schemes. This would provide information as to the ethical consequences of errors in selection procedures, which would aid in the judgment as to whether multivariate prediction formulae have real practical utility. Unfortunately, this type of research would be extremely difficult to carry out, due to the expense of testing individuals who are not accepted for treatment and the problems of locating and contacting an unstable population at follow-up.

Length of treatment involvement. Fewer studies were found in which multivariate prediction of length of treatment involvement was attempted than in which treatment outcome was the criterion variable. Researchers who attempted prediction of length of treatment involvement exhibited a curious bent toward entering personality traits as independent variables, to the exclusion of social or demographic variables. For example, Krasnoff (1976) examined the admission psychological test results of completers and dropouts of a 6-week state hospital alcoholism program. He found that a multiple regression equation based on high Social Desirability Scale scores, high MMPI L (Lie) scale scores, and low scores on a measure of favorable attitudes toward drinking correlated .437 with program completion ($p < .01$). This formula correctly

classified 67% of patients (there were 20% false positives and 13% false negatives). When a discriminant function analysis was performed, any two of the above-mentioned three variables resulted in 73% prediction accuracy (11% false positives and 16% false negatives). O'Leary et al. (1977) developed a discriminant function to predict completion of aftercare following a veterans' 60-day program, based on somatization, psychotic distortion, depression (all derived from the MMPI-168), and locus of control. The resulting Wilkes Lambda was .86 ($p < .05$). When weights were dropped, 70% of subjects were correctly classified, which was a 10% improvement over the base rate prediction of dropping out. Dropouts from the original inpatient treatment phase were excluded from the analysis. Mozdzierz et al. (1973) examined the relationship between certain selected MMPI scales and special scales and leaving inpatient treatment against medical advice (A.M.A.). While A.M.A. subjects were significantly more denying of problems, denying of distress, and defensive, and less overtly dependent than non-A.M.A. alcoholics, the Dependency scale alone discriminated between A.M.A. and non-A.M.A. patients as effectively as all four variables combined.

In an outpatient setting, Heilbrun's (1971) system of assigning "pluses" for high education, high IQ, and low MMPI measures of schizophrenia and hypomania was related to time in treatment at the .025 level of significance. Statistical significance was retained upon cross-validation. Trice and Roman (1970) studied a different aspect of involvement in treatment: twice weekly A.A. attendance for 1 year after state hospital treatment. A regression equation comprised of 24 variables accounted for 36% of the variance in A.A. affiliation. The predictor variables were: not depressed on psychiatrists' card

sorts of the Clyde Mood Scale, a high 16PF "O" scale, a low score on the 16PF "F" scale, high 16PF "H" scale, no history of alcoholism among siblings, "friendly" on psychiatrists' Clyde sort, high MMPI "Am" scores, low on "aggressive" on psychiatrists' Clyde sort, a high number of previous hospitalizations, young age, a longer period of alcoholism, non-American nativity, high 16PF "Q_2" score, high 16PF "I" score, high 16PF "B" score, high MMPI "A" score, father having had a high status occupation, "sick" on the Clyde, alcoholism in one's family of origin, good physical health, a short follow-up period, a low EEG pathology rating, low self ratings of "aggression" on the Clyde, and a low MMPI "D" scale. One of the 24 variables, short follow-up period, is not a predictor in the practical sense. Trice and Roman concluded that psychological and physical variables predict posttreatment A.A. affiliation better than sociological variables.

In summary, researchers who have attempted multivariate prediction of length of treatment involvement have shown a favoritism toward using personality variables as predictors, and there is some evidence that these psychological variables are better predictors than sociological variables. Discriminant function analyses have typically resulted in correct classification into treatment completion versus dropout categories at approximately a 70% rate, which is slightly lower than hit rates for formulae which predict categories of treatment outcome. Levels of statistical significance have been lower than those obtained when treatment outcome was the criterion. It can be concluded, then, that length of involvement in alcoholism treatment can be predicted from combinations of variables measured at admission, but this sort of prediction is less accurate than is the case for treatment outcome,

perhaps because of the inefficiency of sociological variables as predictors. This conclusion is consistent with the literature on individual predictor variables, which are more clear-cut in predicting treatment outcome than in predicting length of stay in treatment.

Summary: State of the Art

The prediction of alcoholism treatment outcome and length of involvement in treatment based on patients' characteristics at admission is a research field in which a vast number of studies have been performed but the results are difficult to pull together and conceptualize. Nearly 100 multivariate studies were examined, and the findings on an almost countless array of predictor variables were tabulated to allow the selection of the 19 variables which were most consistently predictive of treatment success or long treatment involvement. The 19 variables which were judged to be the most reliable predictors were age, socioeconomic status, social stability, legal difficulty, age of onset of problem drinking, alcoholism in family of origin, amount of previous sobriety, amount of previous treatment for alcoholism, previous affiliation with A.A., alcoholic withdrawal symptoms and syndromes, overall mental health, neurosis, depression, obsessive compulsive traits, antisocial personality disorder, characterological anger, schizophrenia, intelligence, and defensiveness or denial.

The literature suggests that alcoholics who enter treatment at an older age are more likely to achieve abstinence and/or successful overall adjustment than those who enter treatment at a younger age. This conclusion provides the first hint that recovery from alcoholism is a different process than recovery from neurosis, although psycho-

therapy is often used in treating both types of disorders. Treatment of neurosis is a process of altering personality defenses, and rigidity in the older patient is a hinderance. Perhaps, then, successful treatment of alcoholism involves a tightening of defenses, so that the rigidity of an older individual is an asset. It behooves one to recall that alcoholism was once classified as a personality disorder. Clinical lore posits that the best outcome which can be hoped for among personality disordered individuals is that tension level is decreased as defenses are tightened, although the fundamental personality structure remains the same. The same principle may apply to alcoholism . This would not be surprising, for at a very concrete level, an alcoholic achieving abstinence must learn to control an impulse. Perhaps this sort of control is better achieved by strengthening existing defenses than by attempting to alter personality structure by removing maladaptive defenses. The older alcoholic, then, with more chronic, deeply embedded defenses, is better suited to having his defenses strengthened to the point where they control the impulse to drink. In addition, some personality disorders, most notably the antisocial personality, are said to "burn out" with age. If alcoholism is related to personality disorder, then perhaps the burning out process in the older patient makes him more amenable to recovery.

Two other, contradictory explanations have been offered for the better prognosis of older alcoholics. First, older alcoholics are likely to have been addicted to alcohol longer. Because their illness is more severe, they are more motivated, and hence benefit more from treatment. This argument receives little indirect support however, because duration of addiction has usually been found to be unrelated

to outcome, and because the general trend in the prediction literature is that better adjusted, less impaired alcoholics fare better. The other, and opposite, explanation is that older alcoholics have survived longer before seeking treatment, and therefore must be less severely addicted. Their milder problems make them more amenable to treatment. This hypothesis is more consistent with research results on other predictors, such as withdrawal symptoms.

The literature on the relationship between patients' age at admission and their length of stay in treatment is inconclusive, leading the reviewer to believe that age is unrelated to length of treatment involvement among alcoholics. There may be a very slight trend for older alcoholics to remain in treatment longer.

Alcoholics of higher socioeconomic status have better outcomes than those from the lower social strata, according to previous research. One study suggests that this effect may diminish as the length of the treatment program increases. The present study, conducted in a very long-term program, will serve as a replication of this finding. Two of the components of socioeconomic status, years of education and occupational status, are also positively correlated with alcoholism treatment success. Income level does not seem to be related to outcome, suggesting that a two-factor social class measure based on education and occupation is a more promising predictor variable than a three-factor index which includes income.

Socioeconomic status has had no consistent effect on duration of involvement in treatment, nor has education alone. Occupational level has not affected length of stay in inpatient treatment or in outpatient medically oriented alcoholism treatment. One study suggests that a

high occupational level predicts acceptance of outpatient psychotherapy, but replication is needed.

Perhaps the most consistent predictor of alcoholism treatment success is high social stability, which is usually defined by factors such as holding a steady job, living in one place for several years, living with significant others, and being married. The individual component variables which comprise social stability are also fairly predictive of positive alcoholism treatment outcome. It may be reasoned that an alcoholic who is socially stable is one with more strengths and with a less severe impairment due to his illness. He therefore has fewer handicaps to overcome, has more to regain, and is better motivated to recover.

The socially stable alcoholic may resist committing himself to entering inpatient treatment, perhaps because the environment which he is forced to give up temporarily by entering treatment is more gratifying. However, once in any kind of alcoholism treatment, socially stable alcoholics tend to be more persistent in staying in treatment than their less stable counterparts. This conclusion suggests that socially stable alcoholics are highly motivated to recover, which in turn lends credence to the motivation explanation of the relationship between social stability and treatment outcome, presented in the preceding paragraph.

As for the effects of the components of social stability on length of treatment involvement, married alcoholics remain in outpatient treatment longer, but do not remain in inpatient treatment any longer, than unmarried alcoholics. Perhaps spouse pressure is the factor which keeps married outpatients in treatment. Occupational stability predicts

a longer stay in treatment, but living with others versus alone is unrelated to length of treatment involvement.

A fairly consistent finding has been that an extensive police record predicts poor outcome after residential alcoholism treatment. A number of factors may account for this. An extensive arrest record is, in a sense, the converse of social stability. Since high social stability predicts success, legal problems predict failure. Drinking-related arrests, in addition to reflecting lack of social integration, may also reflect severity of addiction, so that the severe alcoholic who is continually being arrested for drunk and disorderly or drunken driving has a poorer prognosis than the less severely addicted individual. Criminal arrests are a consequence of antisocial behavior. Since the antisocial personality is a predictor of failure, arrests are a negative prognosticator. It is surprising, in light of these arguments, that the negative predictive effect of extensive legal trouble has been less consistent for outpatients than for inpatients.

There has been relatively little research on the effect of legal difficulty on length of treatment involvement. A trend, which needs further replication, emerges for alcoholics with a high number of arrests to abort treatment prematurely.

Alcoholics whose addictions begin at a later age have better prognoses than those with younger ages of onset, perhaps because they have a history of intact functioning to return to and to provide strengths on which to build. Duration of addiction, however, has largely been found unrelated to outcome. It is a composite variable in which the positive predictive effects of older age and late age of onset of alcoholism cancel each other out, yielding erratic results.

Little research was found regarding the effect of age of onset on length of treatment involvement. The scant literature provides a hint that a late age of onset and an addiction of short duration predict completion of inpatient programs, but do not affect length of stay in outpatient treatment.

Alcoholism in an alcoholic's family of origin is among the weaker of the 19 predictors selected for study. Although the literature is equivocal, there may be a slight effect for alcoholics who had an alcoholic parent to have poor prognoses. If this trend is valid, a speculation would be that the drinking habits of alcoholics with an alcoholic parent are learned earlier and are more deeply ingrained than the drinking behavior of alcoholics from nonalcoholic families. The only two studies found on the effect of alcoholic parents on patients' length of stay in treatment have conflicting results, so no conclusions can be drawn.

Significant periods of pretreatment abstinence predict posttreatment abstinence, although ceiling effects sometimes inhibit the predictive effect of pretreatment abstinence on change in drinking behavior. A number of reasons could account for this relationship: Past behavior predicts future behavior of the same type, previous periods of sobriety may reflect motivation for abstinence, and/or alcoholics who achieved periods of abstinence prior to treatment are less severely addicted than those who did not. The effect of previous sobriety on posttreatment overall adjustment (as opposed to abstinence) needs additional verification.

It is difficult to reach conclusions regarding the effect of pretreatment abstinence on length of stay in outpatient treatment.

Some research indicates a long stay in treatment for those with previous sobriety; other research suggests a curvilinear relationship between previous sobriety and length of stay. No research was found on the effect of previous sobriety on length of stay in inpatient alcoholism treatment.

In reading the literature on the effect of previous (unsuccessful) treatment attempts on alcoholism treatment outcome, it is difficult to differentiate between previous admissions to one particular alcoholism program, any alcoholism treatment program, and general psychiatric treatment. The literature on the relationship between previous treatments and success in current treatment is somewhat equivocal, but a trend emerges for alcoholics with less previous treatment to have better prognoses. Perhaps these individuals as a group are not already proven treatment failures, and therefore a higher proportion of them recover.

In traditional verbal psychotherapy treatment of alcoholism, patients with previous admissions to treatment are likely to drop out. Having already experienced failure in previous treatments, they may wish to avoid the stresses of therapy. In supportive forms of alcoholism treatment such as A.A. and halfway houses, clients with previous treatments seem, from the literature, to stay longer. Perhaps this group of social outcasts can find acceptance in these forms of treatment.

Regular attendance at A.A. meetings before treatment has predicted posttreatment abstinence, but has not been found related to overall adjustment following alcoholism treatment. This discrepancy suggests that the predictive effect of previous A.A. involvement is not accounted for by a correlation with social stability, but rather is due to treatment-like effects of the A.A. program on alcoholism as a disease entity

independent of social or personality functioning, or by a correlation between A.A. involvement and motivation for abstinence. The literature provides a hint that previous A.A. affiliation predicts longer stay in outpatient treatment. The relationship between previous A.A. attendance and length of stay in inpatient treatment was not addressed in the literature which was reviewed. The present study, performed in a residential setting, can make a significant contribution here. If a significant relationship is found between pretreatment A.A. involvement and length of stay at Independence House, an implication might be that previous A.A. attendance reflects motivation, and therefore that the effect of previous A.A. involvement on outcome is due to its correlation with motivation. Of course, a relationship between A.A. attendance and length of stay, if one is found at Independence House, could also reflect social affiliation or institutional dependency.

A far-from-unanimous trend was found in the literature for a history of withdrawal-type symptoms (blackouts, tremors, alcoholic hallucinosis, delirium tremens, and/or seizures) to portend a poor treatment outcome. This suggests that alcoholics with more severe physical addictions are more difficult to treat. There is little previous research on the effect of a history of withdrawal symptoms on length of stay in treatment, and the results are inconsistent.

The weakest of the 19 predictor variables reviewed here is overall mental health. Only when past psychiatric treatment is included among the measures of psychiatric maladjustment does a trend emerge for better adjusted alcoholics to have better prognoses. Even this trend is muddled by authors' failure to clearly differentiate between previous treatment for alcoholism and general psychiatric treatment. The literature

also manifests an extremely weak, equivocal trend for psychologically maladjusted alcoholics to leave treatment prematurely. If this trend is valid, it is disappointing that those alcoholics who are most in need of psychiatric help are the least receptive to accepting help.

When researchers have made the assumption that alcoholics have diagnosable underlying personality disturbances and have gone on to categorize their subjects by personality type, then those with neurotic diagnoses have been found to have better prognoses than those with other diagnoses. This is consistent with the general psychiatric axiom that neurotics respond better to psychotherapy than psychotics and character disordered patients. If, on the other hand, degree of neuroticism is assessed as a pure variable, against a background of normalcy, then the effect of neuroticism on alcoholism treatment outcome is equivocal. More research is needed on the relationship between neuroticism and length of stay in treatment. The existent research suggests that neurotic alcoholics are more likely to complete inpatient milieu treatment than other diagnostic subtypes of alcoholics.

As is the case with neurotic alcoholics, depressed alcoholics seem to fare well when compared with other diagnostic groups, according to previous research. When depression is assessed as a pure variable, there is some evidence that depressive alcoholics have poor outcomes. The apparent positive prognostic effect of a depressive diagnosis, then, may be an artifact of the negative outcome associated with other secondary diagnoses such as antisocial personality. The research on depression as a predictor of length of stay in treatment is fairly extensive, and it leads to the conclusion that depressed alcoholics

leave treatment prematurely. Perhaps the inertia and withdrawal associated with depression interfere with investment in treatment.

Surprisingly, obsessive compulsive alcoholics have good prognoses for recovery, according to the literature reviewed here. As was implied by the positive prognostic effect of older age, the positive effect of obsessive compulsive traits suggests that recovery from alcoholism is a different process than recovery from, for example, neurosis. Rigidity seems to aid recovery from alcoholism, while it is believed to hinder treatment of neurosis. Again, it seems that recovery from alcoholism involves strengthening defensive control over a habit, and individuals with rigid defenses seem well suited for this process. There is simply not enough research to warrent conclusions about the effect of obsessive compulsive traits on length of stay in treatment.

Alcoholics with personality disorders, especially of the antisocial type, have poor prognoses. This has been one of the most consistent findings in the prediction literature, and it has held true whether the antisocial alcoholic has been contrasted with other diagnostic subtypes of alcoholics or whether the antisocial character style has been assessed as a pure variable. Apparently, then, the antisocial personality is a stronger, more fundamental predictor of alcoholism treatment failure than either neurosis or depression is a predictor of treatment success. The positive prognostic effects of the latter two variables may be in part caused by the fact that they imply a lack of sociopathy.

The MMPI Pd scale, a measure of antisocial traits, may be a weak predictor of dropping out of alcoholism treatment. A finding which needs replication is that personality disorder, as evidenced by simplistic, black and white perceptions of other people, predicts

short stay in a halfway house.

In over half of the studies in which it was studied, excessive anger and aggression predicted a poor outcome for alcoholics in treatment. This would be expected intuitively, as excessive, unprovoked anger is a feature of some types of personality disorder. However, the literature does not indicate a relationship between characterological anger and length of stay in treatment. This nonrelationship is rather surprising, in that one might expect characterologically angry alcoholics to become angry enough at treatment personnel to cause them to leave treatment prematurely.

A general trend in the literature is for alcoholics who are also schizophrenic to have poor outcomes. This principle may not apply to behavior therapy of alcoholism. Speculations to account for the negative effect of schizophrenia on alcoholism treatment outcome are that schizophrenic thought disorder interferes with benefiting from verbal psychotherapy, and that the tranquilizing medications used to treat schizophrenia are in conflict with the A.A. philosophy of abstinence from all drugs. There is indirect evidence that schizophrenic alcoholics tend to leave treatment early. Several speculations might be advanced to account for this trend. Treatment modalities in alcoholism rehabilitation programs may be perceived by schizophrenics as inappropriate for them; schizophrenics may be asked to leave treatment by staff and referred to mental health facilities if their symptomatology becomes disruptive; or the denial associated with psychotic states may preclude motivation for treatment. The latter explanation, although intuitively appealing, is not supported by the research which indicates that denial and defensiveness are unrelated to length of treatment involvement.

A nonunanimous but marked trend emerges from previous research for more intelligent alcoholics to respond well to treatment, perhaps in part because the verbal psychotherapy often used as part of the treatment regimen is most effective on individuals of at least average intelligence. Previous research does not indicate a relationship between alcoholics' intelligence and their length of stay in treatment.

In order to benefit from treatment, an alcoholic must not begin with excessive denial or defensiveness. That is, he or she must admit to having a problem or problems, and must be willing to explore the problem(s) and accept help. However, as has been mentioned previously, recovery from alcoholism seems to be a process in which defensiveness increases. Although one would also expect that defensive alcoholics would leave treatment early because of their failure to admit that there are problems with which they need help, the literature indicates that denial and defensiveness do not affect length of stay in treatment. Perhaps the most denying alcoholics never get as far as applying for treatment.

Characteristics of treatment successes. Based on the literature reviewed in this chapter, the following portrait emerges of the alcoholic who is likely to be abstinent and/or well adjusted following treatment. He is socially stable, in that he has held a steady job, has lived in one place for a few years, is married, and lives with significant others. He does not have an extensive police record. He is not antisocial, characterologically angry, or schizophrenic. If he must be classified according to personality type, he is likely to be neurotic, obsessive compulsive, and/or depressed. He is not too depressed, however. He is not unduly defensive about his problems, yet he has enough rigidity

to allow him to learn control over his maladaptive habits. He is likely to be older than his less fortunate counterpart, and his addiction began at a later age. While he has attended A.A. regularly, he has had little or no professional treatment for alcoholism other than A.A. He has been able to maintain some periods of abstinence prior to treatment. He is fairly intelligent and of relatively high socioeconomic status. It is possible that he has a little better general psychological adjustment than his counterpart who does not benefit from treatment, and he may be a little less likely to have had alcoholic parents.

Characteristics of alcoholics who remain in treatment. The portrait of the alcoholic who stays in treatment the recommended length of time must be regarded as more tentative than the portrait of the treatment success, because less research has been performed on length of treatment involvement than on treatment outcome. The alcoholic who remains in treatment is not depressed and, in all likelihood, not schizophrenic. His other personality characteristics are less clear-cut, but he is probably not antisocial. He may be neurotic, and perhaps he is a little better adjusted overall than his counterpart who drops out of treatment. He is generally socially stable, and, more specifically, he is occupationally stable (he may have resisted entering inpatient treatment, but once enrolled, he persists in the program). He probably does not have an extensive arrest record. If he is an outpatient, he is likely to be married and to have attended A.A. regularly prior to treatment. If he is an inpatient, his addiction was of late onset and is of short duration. If the treatment in which he is lengthily involved consists of active psychotherapy, he has had little previous treatment. If the program which he persists in is mainly supportive, he has made numerous

previous attempts at getting help for his problem.

Summary of multivariate prediction of outcome and length of stay. When researchers have attempted to predict alcoholism treatment outcome by combining several independent variables into prediction equations, the multiple correlation coefficients have typically been around .60. Up to 1/3 of the variance in treatment outcome has been accounted for by various combinations of patient characteristics measured at admission, and this is more variance than has been explained by treatment variables. Apparently, then, alcoholics' predispositions to improve or not improve are more powerful determinants of their response to treatment than aspects of the treatment itself. Discriminant function analyses based on such variables have generally classified patients into "improved" versus "unimproved" or "abstinent" versus "drinking" categories with about 80% accuracy.

The multivariate prediction of length of stay in treatment has not been quite as convincing as the prediction of treatment outcome. Personality variables have contributed more to the prediction of length of stay than have demographic or social variables. Discriminant analyses have classified alcoholics into categories such as program completers versus dropouts with about 70% accuracy.

Although multiple correlation coefficients between intake variables and both treatment outcome and length of stay in treatment have been statistically significant, their practical significance for use in admission screening is borderline. Information about the fate of alcoholics not accepted for treatment, although difficult to obtain, would help program administrators make better-informed decisions about whether to employ prediction equations as selection criteria.

Hypotheses and Expectations

To reiterate, the following 19 predictor variables, all measurable at admission, are investigated in this study:

Age

Socioeconomic status

Social stability

Number of arrests

Age of onset of problem drinking

Problem drinking by patients' parents

Length of longest previous period of sobriety

Number of previous admissions for alcoholism treatment

Previous regular A.A. attendance

History of withdrawal symptoms

Overall mental health

Neurosis

Depression

Obsessive compulsive traits

Antisocial personality disorder

Anger

Schizophrenia

Intelligence

Defensiveness

The formal hypotheses are stated in the null form.

Hypothesis 1. There are no relationships between any of the above variables and successful outcome from long-term residential treatment among male alcoholics.

Hypothesis 2. Successful outcome from long-term residential

treatment among male alcoholics cannot be predicted by any combination of the above variables.

Expectations regarding treatment outcome. In approximate descending order of anticipated predictive power, it is expected that alcoholics with successful outcomes will: be less antisocial, be more socially stable, have longer periods of previous sobriety, have had fewer arrests, be more obsessive compulsive, have attended A.A. regularly, be of high socioeconomic status, be more neurotic, be older, be more intelligent, be less defensive, be less angry, have been older when their drinking problem started, not have had alcoholic parents, not be schizophrenic, have had few previous admissions for alcoholism treatment, have had fewer withdrawal symptoms, be less depressed, and be generally psychologically healthier. It is expected that treatment outcome can be predicted by a combination of these variables, with the variables listed first in this paragraph figuring most prominently in the prediction.

Hypothesis 3. There are no relationships between any of the above predictor variables and length of stay in a long-term residential treatment program among male alcoholics.

Hypothesis 4. Length of stay in a long-term residential treatment program among male alcoholics cannot be predicted by any combination of the above variables.

Expectations regarding length of stay. In very rough descending order of anticipated predictive power, it is expected that alcoholics with long lengths of stay in treatment will: be less depressed, be socially stable, not be schizophrenic, be less antisocial, have been older when their drinking problem started, have had fewer arrests, be neurotic, have attended A.A. regularly, be generally psychologically

healthy, and be older. The relationship between the remaining nine predictor variables and length of stay will be investigated empirically. It is anticipated that length of stay can be predicted by a combination of predictor variables, with the variables listed first in this paragraph contributing most to the prediction.

Comment. Differences between the predictors of treatment outcome and length of stay identified in this study and those suggested by previous research will be discussed in terms of the characteristics of the Independence House program (especially its length) and the measures used in this research.

Purpose

The literature review of the preceding chapter revealed 19 patient characteristics which have often been found to predict outcome and length of stay in short-term alcoholism treatment. To optimize utilization of treatment resources, there is a need to identify the type of patient likely to persist in and benefit from long-term alcoholism treatment. The present study was designed: (1) to determine which of the above-mentioned patient characteristics predict length of stay in and successful outcome from long-term alcoholism treatment, (2) to determine how much of the variances in treatment outcome and length of stay in treatment are accounted for by these patient characteristics, and (3) to develop formulae for predicting length of stay and treatment outcome on the basis of these variables.

Treatment Program

The treatment program which subjects in this study underwent is "Independence House," Norristown (Pennsylvania) State Hospital's specialized treatment unit for chronic alcoholics. Male and female "revolving door" (multiple previous unsuccessful alcoholism treatment experiences) alcoholics are accepted for admission who: (1) are free of intoxicants for at least 5 days prior to admission, (2) have no present signs or history of overt psychosis, (3) are not severely neurologically impaired, (4) are age 18 to 60, and (5) are not so severely antisocial so as to disrupt program functioning. The patient census averages between 30 and 40.

The treatment team has representatives from psychiatry, psychology, social work, rehabilitation counseling (recovered alcoholics now employed as therapists), occupational therapy, music therapy, and nursing.

Insight-oriented group psychotherapy is the primary treatment modality (approximately 10 1½-hour sessions per week). This is supplimented by part-time employment in the community, medical and dental care, Alcoholics Anonymous meetings, social service casework counseling, didactic teaching about alcoholism, vitamin therapy, occupational therapy, recreational therapy, music therapy, pastoral counseling, and (when indicated) individual psychotherapy, family or couples therapy, and Antabuse. A behavioral management system rewards patients for accruing sober time by making various levels of off-ward and off-grounds privileges contingent upon abstinence and participation in program functions and activities. Although all patients are voluntarily committed to the hospital and ward doors are unlocked, patients are encouraged to remain in treatment for the recommended 6 to 12 months. After a patient has been in the program for 5 to 7 months, a decision is made by the treatment team as to whether continued intensive psychotherapy would be profitable. If so, the patient receives approximately 6 more months of therapy. If not, his re-entry into the community proceeds more quickly (Wieman et al., Note 1).

Procedure

This study was performed post hoc. The researcher searched the records of former Independence House patients to compile data which had been collected by Independence House staff during the past five years. Several sources of data were utilized. First, all applicants to the Independence House program undergo a screening interview conducted on the unit. The interview is conducted by a psychiatrist, psychologist, or social worker. Representatives from

these three disciplines are present at the interview, as are representatives from nursing and rehabilitation counseling. The interview is semi-structured, with inquiry routinely made into various aspects of applicants' social backgrounds, drinking histories, previous treatment experiences, and psychological functioning. For those applicants who are admitted to the program, information obtained in this initial interview is transcribed into an admission note, which is filed in the patients' charts. Second, rehabilitation counselors and nursing staff who attend the admission interview also record information in notebooks. Their notes, which tend to focus more heavily on issues regarding applicants' drinking histories, corroborate the formal admission notes and often fill in any informational gaps.

On the day of their admission, all new patients undergo a process of formal admission to the hospital. As part of this process, demographic and sociological information is recorded on a standard form, referred to here as a "face sheet," which is filed in their charts. Within 48 hours of a patient's admission, one of Independence House's two rehabilitation counselors completes a "STEP" (Systematic Treatment and Evaluation Procedure) document for filing in the patient's chart. On this form, the counselor rates the patient's present and expected status on various traits, symptoms, and other variables, based on her observation of the patient's behavior.

Social histories are gathered and written by the unit's social work staff. When possible, a significant other in a new admission's life serves as the informant for the history. When this is not possible, the patient himself serves as the source of information regarding his background. Finally, beginning in August, 1974, all newly admitted

patients at Independence House have been given a battery of paper and pencil psychological tests: the Shipley-Institute of Living Scale for Measuring Intellectual Impairment, the Minnesota Multiphasic Personality Inventory, Form R (MMPI), and the Rotter Incomplete Sentences Blank - Adult Form (ISB). The tests are administered in group form by a Ph.D. clinical psychologist. Except for the ISB (see under "Measures"), they are scored by one of two Ph.D. clinical psychologists. This battery is usually administered within 2 weeks of admission and always within 1 month of admission.

The source(s) of data for the specific predictor variables is presented in more detail below, under "Measures." A Ph.D. clinical psychologist obtained and compiled 6-month follow-up data on treatment outcome. Again, the details are presented below under "Measures."

Measures

Age. A patient's age at admission, defined as his age on his last birthday before admission, was computed by subtracting the date of birth listed in his chart from his admission date.

Socioeconomic status. The Hollingshead and Redlich Two Factor Index of Social Position (Myers & Bean, 1968, pp. 235-237) was used to compute each patient's Index of Social Position Score. Socioeconomic status may be defined by a person's education and occupation, or by his education, occupation, and income. The former definition is adopted for use here, because, as was indicated in the literature review, education and income have been found predictive of treatment outcome in previous research, but income level has been found unrelated to outcome. In order to assess socioeconomic status, a patient's usual occupation and his amount of education (number of years) were noted

on his face sheet, with corroboration by his admission note and social history. His occupation and his education were then each ranked into one of seven categories which were defined by Hollingshead and Redlich. Using Hollingshead and Redlich's formula, the index was computed by weighting occupational ranking by seven and weighting educational rank by four, and summing the resulting products. Index of Social Position scores can range from 11 to 77, with higher scores denoting lower social standing.

Social stability. As was discussed in the previous chapter, many researchers have used variations of the 4-point social stability scale devised by Straus and Bacon (1951), in which points are assigned for holding a steady job, living in one place, living with significant others, and being married. Information on patients' residential mobility, however, was not available to this researcher. Therefore, a composite index of social stability similar to that successfully employed by Gerard and Saenger (1966) was used. Scores on the index ranged from 0 to 3, with 1 point being assigned for each of the following: (1) having held a steady job for at least 3 years (from social history and face sheet), (2) living with family or friends (from face sheet), and (3) married, not separated (from face sheet). A higher score on this index indicates a more socially stable individual.

Number of arrests. During the admission screening interview, an applicant for admission to Independence House is asked to describe his history of legal difficulties, which is then summarized in his admission note. To measure extent of legal difficulty for this study, the number of times that a subject was arrested was noted in the admission note, with corroboration by the social history. Arrests were simply

counted, regardless of whether they resulted from drinking-related misdemeanors, driving while intoxicated charges, or criminal acts.

Age of onset. During the admission interview, applicants to Independence House are asked, "When did drinking first become a problem for you?" The resulting self-reported age of onset of problem drinking, to the nearest year, was noted in subjects' admission notes, with corroboration by their social histories.

Problem drinking by patients' parents. While being screened for admission, a patient is asked whether anyone in his family has had a drinking problem. Subjects' answers to this question, recorded in their admission notes, provided the data for a dichotomous measure of problem drinking by patients' parents. Again, corroboration was provided by the social histories. The variable was coded "1" if neither parent had a drinking problem, and was coded "2" if either parent or both parents had a drinking problem.

Longest previous period of sobriety. During their admission interview, Independence House applicants are routinely asked, "What is the longest period of time you've been able to stay sober?" The new patient's answer regarding the length of his longest period of abstinence since the onset of his drinking problem, excluding time in previous residential treatment, was found in the rehabilitation counselors' admission notes, with corroboration by the nurses' admission notes, the admission note, and the social history. The length of the longest sober period was rounded to the nearest month.

Number of previous admissions. For each patient, the number of previous admissions to alcoholism treatment programs was noted on the face sheet, with corroboration by the social history. Both inpatient

and outpatient alcoholism admissions were included, but simple detoxifications and general psychiatric admissions were excluded.

Previous regular A.A. attendance. Another standard question asked of applicants during the admission interview is, "What has been your involvement with A.A.?" Patients' answers to this question are summarized in the rehabilitation counselors' notes, corroborated by the nurses' admission interview notes, the admission notes, and the social histories. In these sources, patients' previous A.A. attendance is described qualitatively, rather than quantitatively. In order to discern from these sources whether a patient had, at some time since the onset of his addiction, attended A.A. regularly, the researcher used a key word approach. The general principle adhered to was that this variable refers to a behavior (regular A.A. attendance), not an attitude (feelings toward or sense of involvement in A.A.). The variable was assessed dichotomously. A patient was judged as having attended A.A. regularly if his involvement was described by phrases such as: regular, continuously, attended but not active, went but hated it, yes but negative about it, had a sponsor, attended but not involved, inconsistent but sober for 2 months with A.A., every night for 2 months and then intermittently, and 6 years in and out. A patient was judged as not having had a period of regular A.A. attendance if his involvement with A.A. was described as marginal, sporadic, intermittent, occasional, poor involvement, a few meetings, on and off, seldom, dabbled in it, some, infrequent, always had a problem with A.A., tried it, not too much, A.A. hard to take, little, a short time, once, peripheral involvement, slides out when feeling good, hit and miss, erratic, only when in treatment programs, and likes it but sporadic attendance. A code of "1" indicated absence

of previous regular A.A. attendance; a code of "2" indicated presence of previous regular A.A. attendance.

History of withdrawal symptoms. One point was assigned for each of the following which a patient had experienced (according to self-report): (1) alcoholic blackouts, (2) tremors, (3) alcoholic hallucinosis, (4) delirium tremens, and (5) withdrawal seizures. The result was a 0 to 5 scale of withdrawal symptoms. This data was originally obtained during the admission interview, during which an applicant was asked whether he has ever experienced each of the five symptoms/syndromes. The researcher gathered the data from the admission notes, with corroboration from the face sheets.

Overall mental health. General psychological adjustment was assessed in two ways, one objective and one projective. The Sines and Silver (1963) Index of Psychopathology (Ip) was used as an objective measure of degree of general maladjustment. Based on MMPI T-scores, this index was computed by the formula, $Ip = .10(Pa) + .06(Sc) - 6.26$. Sines and Silver derived the index with multiple regression techniques, and found it to be highly predictive of experienced clinicians' ratings of overall pathology, irrespective of type. Sines and Silver reported that upon cross validation, the index correlated .87 to .89 with clinical judgments of degree of psychopathology.

Because the Ip was derived based on a sample of psychiatric inpatients, it was thought desirable to also include a measure of overall adjustment which was normed on a less disturbed population. To accomplish this, the researcher scored patients' Incomplete Sentences Blank (ISB) protocols according to the system presented in the manual for that test (Rotter & Rafferty, 1950). The test authors stated that the

total score, which can theoretically range from 0 to 240 (higher scores signifying greater maladjustment), "is an index of maladjustment," and reported a biserial correlation coefficient of .62 between males' ISB scores and their classification as "adjusted" or "maladjusted" as evidence of validity. The researcher scored the protocols before he collected data on the criterion variables in this study, to avoid biased scoring. The ISB protocols of 59 Independence House patients had previously been scored by a Ph.D. clinical psychologist. A Pearson's r of .82 was computed between that psychologist's scorings and the researcher's later independent scorings of the same protocols. In addition, 20 randomly selected ISB protocols were scored independently by another Ph.D. psychologist. A Pearson's r of .95 was obtained between that psychologist's scorings and the researcher's scorings of the 20 protocols. These two correlation coefficients compare favorably with the interscorer reliabilities of .90 to .91 reported in the test manual, thereby confirming the accuracy of the examiner's scoring of this projective test.

Neurosis. Because of the treatment philosophy of Independence House, all newly admitted patients receive a primary characterological diagnosis and a secondary diagnosis of alcohol addiction. This practice restricts the range of diagnoses assigned. In addition, the literature presented in the previous chapter indicates that although diagnosis is a practically useful predictor of alcoholism treatment outcome, the apparent predictive effects of some diagnostic labels are partly due to artifacts of the effects of other diagnostic categories which the particular diagnosis precludes. Because of these two considerations, diagnosis was not used as a measure of any predictor variable

in this study. Instead, diagnostic personality variables were assessed as unidimensional traits. Regarding neurosis as a predictor variable, the degree to which a subject was neurotic at admission was determined by his "neurotic score" on the MMPI: the sum of his T-scores on the Hs, D, and Hy scales (Ruesch & Bowman, 1945).

Depression. Diagnosis was not used to assess depression because of the considerations discussed above under "Neurosis," and the MMPI D scale was not used because previous literature has not shown that scale to be a particularly useful predictor of alcoholism treatment outcome. Rather, STEP document ratings were used. On this document, one of Independence House's two rehabilitation counselors rated each new admission on degree of depression according to the following 7-point scale: (1) no apparent problem, (2) very minor problem, (3) problem of modest proportions, (4) relatively severe problem, (5) severe problem, (6) extremely severe problem, (7) problem of devastating proportions.

Obsessive compulsive traits. Again, formal diagnoses were ignored. The MMPI Pt scale T-score was used to measure the degree of a patient's obsessive compulsiveness (Duckworth & Duckworth, 1975, pp. 116ff.). This scale was a significant predictor of treatment outcome in a study by Hedberg et al. (1975), and a useful predictor of length of stay in treatment in a study by Hoffmann and Jansen (1973).

Antisocial personality. In assessing degree of antisocial tendencies, diagnosis was avoided as a measure for reasons already stated, and the MMPI Pd scale was used (Duckworth & Duckworth, 1975, pp. 84ff.). This approach has been used successfully in the prediction literature (Hedberg et al., 1975).

Anger. As was the case with depression, the degree to which a

patient had a problem with "excessive anger" was determined by a rehabilitation counselor's rating on the STEP document. The same 7-point scale was used to rate excessive anger as was used to calibrate depression.

Schizophrenia. Patients who are overtly psychotic or who have a clear history of overt psychosis are not admitted to Independence House. However, some patients who do not appear schizophrenic on admission begin to exhibit psychotic behavior after entering the program. The researcher's task in identifying the "schizophrenic" portion of the Independence House population, then, was to distinguish between latent (subclinical) schizophrenics and patients without latent psychoses. Peterson (1954) found that such a differentiation could be made quite accurately by counting the number of Meehl's six psychotic signs on patients' MMPI profiles. The six signs are: (1) T scores on 4 or more clinical scales above 70, (2) F > 65, (3) Sc > Pt, (4) Pa or Ma > 70, (5) Pa or Sc or Ma > Hs and D and Hy, and (6) D > Hs and Hy. Peterson found that, depending on which cutting score was used, the scale identified 88% of undiagnosed latent schizophrenics with 39% false positives, or 67% of undiagnosed latent schizophrenics with 18% false positives. Latent schizophrenia among admissions to Independence House, then, was assessed by noting how many of the six psychotic signs were present on patients' MMPI profiles, with scores ranging from 0 to 6.

Intelligence. Each patients' Shipley-Institute of Living Scale IQ was transcribed from his Shipley test protocol on file at Independence house. The test manual cites a reliability coefficient of .92 for the total test (Shipley-Institute, 1967). Regarding the test's validity as a measure of intelligence, various researchers have reported

correlation coefficients between Shipley scores and Wechsler Adult Intelligence Scale Full Scale IQ's of .90 (Sines & Simmons, 1959), .80 (Weins & Banaks, 1960), and .76 (Swinn, 1960). Correlations such as these led Hunt (1949) to declare the Shipley to be satisfactory as a quick measure of intelligence in his review of the test.

Defensiveness. The MMPI K scale T-score was employed as a measure of defensiveness and guardedness (Duckworth & Duckworth, 1975, pp. 27ff.).

Treatment outcome. Independence House is a "dry" program, in that a goal of treatment is complete abstinence from alcohol and drugs. The interdisciplinary, multimodal therapeutic regimen at Independence House is designed to foster improved social and occupational adjustment in addition to sobriety. In order to be consistent with the goals of therapy, then, treatment success was defined as abstinence from alcohol and drugs and satisfactory social and vocational adjustment. More specifically, treatment success was defined by four criteria:

(1) being alive,

(2) being totally abstinent from alcohol and other intoxicants,

(3) being gainfully employed, and

(4) having incurred no new criminal charges or parole or probation violations since discharge.

Two related measures of treatment success were derived from the above criteria. The first measure took the form of a 0 to 4 scale, with 1 point assigned for each of the four outcome criteria which a patient met at follow-up. A higher score meant a more favorable posttreatment adjustment. The second measure was dichotomous, with a former patient classified as a treatment "success" if he met all four criteria at

follow-up, and classified as a treatment "failure" if he failed to meet at least one of the criteria.

Six months was selected as the average follow-up interval for use in the study.[2] There is justification in the literature for choosing this follow-up period. Davies et al. (1956) found that 88% of all relapses occurred within 6 months of discharge. This finding has been corroborated by other investigators. Furthermore, it has been found that the subjects who deteriorate after 6 months are offset by other subjects who improve after 6 months, so that overall findings do not vary significantly with length of follow-up interval (McCance & McCance, 1969). By choosing 6 months rather than 1 year as the follow-up interval, more subjects could be included in the study, allowing more meaningful multivariate analyses.

Three different methods of categorizing treatment outcome were employed in analyzing the data of this study, derived from the two above-mentioned measures of outcome and differing in the ways in which the follow-up data were obtained.

(1) A Ph.D. psychologist mailed a follow-up questionnaire, presented in Appendix A, to each patient discharged from Independence House after January 1, 1976 3, 6, 9, and 12 months after his discharge. As has already been stated, the 6-month postdischarge questionnaire responses were selected for study here. For the former patients who completed and returned the questionnaire 6 months after their discharge, self-report data were obtained regarding all four outcome criteria. The

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[2]The exact follow-up interval ranged from 4 to 8 months, depending on mailing schedules.

first outcome categorization, then, involved rating the adjustment of these individuals based on the number of outcome criteria which they met. The accuracy of self-reports in alcoholism follow-up research is attested to be Gerard and Saenger's (1966, pp. 104-105) finding that only 2% of respondents claiming abstinence were lying. The advantage of employing this outcome assessment was that outcome could be rated on a 0 to 4 scale, rather than a dichotomous scale. The disadvantages were that the return rate on the questionnaire was low (25.9%) and that the sample of those returning the questionnaire was biased towards subjects with favorable outcomes (48.1% of questionnaire respondents met all four criteria, while only 27.9% of subjects about whom some follow-up information could be obtained either first- or secondhand met all four criteria).

(2) The second method of categorizing outcome involved a dichotomous "success" versus "failure" measure on all subjects about whom 6-month follow-up information could be obtained either first- or secondhand. The former patients who returned questionnaires were rated as successes if they met all four outcome criteria, and were rated as failures if they failed to meet at least one criterion. In addition, secondhand information could be obtained regarding the outcomes of the majority of subjects who failed to return the questionnaire. Independence House rehabilitation counseling and nursing staff made inquiry about these individuals through the local Alcoholics Anonymous network. They then reported to the psychologist responsible for follow-up data whether or not each individual met the four outcome criteria. This secondhand method of assessing the outcome of questionnaire nonrespondents has often been employed in previous research (e.g., Selzer & Holloway, 1957).

(3) The third method of categorizing outcome was also a dichotomous rating of "success" versus "failure" based on meeting all four of the outcome criteria. All of the data on the subjects in the second analysis were included. In addition, the individuals who were completely lost to follow-up (i.e., who did not return questionnaires and about whom no secondhand information could be obtained because they could not be located 6 months after treatment) were classified as "failures." The practice of classifying lost subjects as failures is common in the alcoholism literature (e.g., Glatt, 1961). It is justified by Adamson et al.'s (1974) statistical prediction that only 3 out of every 14 lost subjects would be expected to be abstinent. Also, it is intuitive that a former patient who cannot be located, although he may or may not be abstinent, is certainly lacking in social integration and stability, and therefore has not achieved a satisfactory adjustment.

In summary, then, three measures of treatment success at 6-month follow-up were employed:

(1) A numerical, 0 to 4 scale of outcome, based on the number of outcome criteria met. Subjects were those who returned follow-up questionnaires. A higher score signified a more favorable outcome.

(2) A dichotomous, "success" versus "failure" measure of outcome. "Successes" included subjects whose questionnaire responses indicated all four outcome criteria met, and questionnaire nonrespondents about whom secondhand information indicated that all four outcome criteria were met. "Failures" included questionnaire respondents meeting three or less outcome criteria and questionnaire nonrespondents about whom secondhand information indicated three or less outcome criteria met. Subjects about whom no information could be obtained were omitted

from the analysis.

(3) A dichotomous, "success" versus "failure" measure of outcome, identical to the second measure, except that subjects completely lost to follow-up (no first- or secondhand information available) were included in the category of treatment "failures" rather than being omitted from the analysis.

Length of stay in program. The number of days that a patient was in the Independence House program was determined by subtracting his admission date from the date he left the program permanently (which in some cases differed from his formal discharge date, due to the lag in removing the names of patients who elope from hospital rolls).

Subjects

Sex. Male alcoholics discharged from Independence House were selected for study in this research project, for the following reason. Sex has generally not been found to have a main effect on alcoholism treatment outcome (e.g., Gerard & Saenger, 1966), but sex has been found to interact with a number of predictor variables to influence outcome. For example, Bateman and Petersen (1972) discovered that the predictive effects of intelligence, club membership, alcohol consumption, and age at first drink were different for females than for males. Ideally, then, sex would be used as a moderator variable in the assessment of the effects of other predictor variables on treatment outcome. However, female alcoholics tend to be underrepresented in treatment, and the number of females discharged from Independence House during the time interval examined in this study was far too small to permit valid statistical analysis. Since grouping both sexes together would have been likely to cloud the results and since there were not enough

potential female subjects to use sex as a moderator variable, only the male portion of the Independence House population was examined in this study.

Defining discharge dates. The samples of male alcoholics for the analyses in this study were defined by date of discharge from Independence House, based on the availability of certain crucial data. One important parameter was the availability of psychological test protocols, which provided data for eight of the predictor variables. As mentioned above, psychological testing on admissions was initiated in August, 1974. The researcher determined that all patients discharged on or after August 20, 1975, had been admitted during or after August, 1974 (the maximum program length is approximately 1 year), and hence had undergone psychological testing. The "overall sample" of subjects for analyses regarding length of stay in treatment, then, consisted of patients discharged from Independence House between August 20, 1975, and June 1, 1979, the date on which data compilation for the study began. This sample consisted of 265 male alcoholics.

In defining the sample for analyses regarding treatment outcome, another parameter was involved: the availability of 6-month follow-up data. As previously noted, the practice of collecting follow-up outcome data began on patients discharged after January 1, 1976. Data collaboration for this study began on June 1, 1979, and in order for a patient to have had 6-month follow-up data by that time, he must have been discharged before January 1, 1979. The "overall sample" of subjects for analyses regarding treatment outcome, then, consisted of the 209 male alcoholics discharged between January 1, 1976, and January 1, 1979. For the analyses in which first- and secondhand follow-up data were utilized

but the 45 subjects completely lost to follow-up were excluded, the "overall sample" consisted of 164 male alcoholics discharged during the same time interval. For the analyses in which only firsthand questionnaire data were utilized in assessing outcome, the "overall sample" consisted of 52 male alcoholics discharged between the same cutoff dates (the 52 individuals who returned follow-up questionnaires).

Missing data. The "overall samples" described above consisted of patients on whom the appropriate criterion variable data (length of stay and/or one or more of three outcome measures) were available. Some of these patients, however, were missing data on one or more predictor variables, because they left treatment before psychological testing could be performed or before adequate social histories could be obtained, or because of clerical oversight. In performing the various statistical analyses in this study, subjects with missing data on one or more predictor variables were excluded. This practice reduced the number of subjects actually used in the analyses below the number of subjects in the "overall samples." The number of subjects in the "overall sample" for each of the four criterion variables and the number of subjects actually used in the four multivariate analyses after omitting cases for missing data appear in Table 5. In Table 6, it can be seen that the treatment success rates (percentage of patients meeting the criterion for successful outcome at 6-month follow-up) for the two dichotomous measures of treatment outcome increases slightly but insignificantly when cases are omitted for missing data. For the two dichotomous measures of treatment outcome, then, it appears that little or no systematic bias is introduced by omitting cases for missing data. In Table 7, comparable statistics are presented

Table 5

Number of Subjects Used in Multivariate Analyses

Criterion Variable	Number of Subjects	
	With Data on Criterion Variable	After Deleting Cases for Missing Data on Predictor Variables
Dichotomous outcome, lost subjects included as failures	209	158
Dichotomous outcome, lost subjects excluded	164	131
Outcome rating based on questionnaire responses	52	30
Length of stay in treatment	265	199

Table 6

Treatment Success Rates Before and After Deleting Cases for Missing Data: Dichotomous Criterion Variables

Criterion Variable	Percentage of Subjects with Successful Outcome	
	Among all Available Cases	After Deleting Cases
Dichotomous outcome, lost subjects included as failures	27.9	30.4
Dichotomous outcome, lost subjects excluded	35.6	36.6

Table 7

Mean Values on Criterion Variables Before and After Deleting Cases for Missing Data: Numerical Criterion Variables

Criterion Variable	Mean Value on Criterion Variable	
	Among All Available Cases	After Deleting Cases
Outcome rating based on questionnaire responses (maximum score = 4)	2.83	2.83
Length of stay in treatment (days)	160.27	181.78

concerning the two numerical criterion variables: Outcome rating based on questionnaire responses and length of stay in treatment. Because these variables are numerical rather than dichotomous, mean values on the variables are presented, rather than percentages. For outcome rating, there is virtually no increase in mean outcome, and it is therefore concluded that deleting cases for missing data does not introduce a systematic bias in the data. For length of stay, however, the mean amount of time in treatment increases by approximately 21 days when cases are omitted because of missing data. The cause of this increase is that many of the deleted cases were patients who eloped from treatment almost immediately, before psychological testing could be performed, and who therefore lacked data on variables derived from test results. It is concluded, then, that the analyses regarding length of stay in treatment were based on a favorably biased subsample of the population, and the results of those analyses should be interpreted with caution.

Demographics. The 265 patients in the overall sample for this study averaged 41.2 years of age at admission. Their mean age of onset of problematic drinking (self-report) was 25.2 years. The average patient was being admitted to a program for alcoholism treatment for the fourth time. The sample generally consisted of individuals of relatively low socioeconomic status, as the mean of subjects' scores on the Hollingshead and Redlich Index of Social Position placed them in social class IV (the second lowest of five social classes). The average patient had a history of legal difficulties, as the mean number of arrests was 4.2.

Design

This was a multivariate prediction study. Patients entering a long-term residential alcoholism rehabilitation unit were assessed on 19 variables, one of which (overall mental health) was measured two ways, at or shortly after admission to the unit. Patients' scores on each of these predictor variables were correlated with their length of stay in the program and with three outcome measures combining their abstinence and social adjustment 6 months after leaving the program. In this manner, the predictive effect of each of the 19 intake variables on length of stay and treatment success was assessed. In addition, the efficacy of predicting patients' length of stay in treatment and successful adjustment after treatment based on intake characteristics was evaluated by combining the predictor variables into multivariate prediction equations, using multiple regression and discriminant analysis statistical models.

RESULTS

Overview

The presentation of the results of this study begins with a brief general discussion of the resources, techniques, and strategies of statistical analysis which were utilized. Following that, the specific statistical procedures, findings, and conclusions relative to each of the four hypotheses are presented. Incidental findings are then reported which are not specifically related to the hypotheses but which are of interest nevertheless. The chapter concludes with a summary of the findings.

General Analytic Procedures

The statistical analyses of this study were performed with the aid of Statistical Package for the Social Sciences (SPSS) computer programs. Where dichotomous criterion variables were involved, the "Discriminant Analysis" program performed analyses of variance between individual predictor variables and criterion variables, and performed discriminant analyses where multivariate prediction was needed. In order to determine relationships between individual predictor variables and numerical criterion variables, the "Pearson Correlation" program was employed. For multivariate prediction of numerical criterion variables, the "Multiple Regression" program was used.

In each statistical analysis, cases which were missing data on one or more variables used in that analysis were excluded. In the initial multivariate analyses in which all 20 predictor variables were entered, this practice often resulted in significant decreases in

sample size. In order to increase sample sizes as much as practically possible, multivariate analyses were then recomputed with reduced numbers of predictor variables. The predictor variables for these recomputations were selected on the basis of their predictive power in the initial multivariate analyses. In other words, multivariate analyses were recomputed after omitting predictor variables which showed little or no predictive value in the initial analyses, thereby increasing sample size by reincluding cases which lacked data on one or more of the omitted variables. When this procedure resulted in significant increases in sample size, the recomputations are reported; where it did not, the original analyses based on all 20 predictors are reported.

Findings Relevant to Each of Four Hypotheses

Hypothesis 1: There are no relationships between any of 19 predictor variables and successful outcome from long-term residential treatment among male alcoholics. This hypothesis is addressed by three sets of analyses, which correspond to the three measures of treatment outcome: (1) a success versus failure dichotomy with lost subjects assumed to be failures, (2) a success versus failure dichotomy omitting subjects lost to follow-up, and (3) a 0 to 4 rating of outcome, based on the number of outcome criteria met. Each of these three sets of analyses is presented below, followed by overall conclusions relevant to Hypothesis 1.

First, the relationships between each of the predictor variables and the dichotomous outcome measure including lost subjects as failures are considered. The means and standard deviations of treatment successes and failures on each of the predictor variables are presented in Table

Table 8

Means and Standard Deviations of Treatment Successes and Failures on 20 Predictor Variables, Lost Subjects Included as Failures

	Successes		Failures		
Predictor Variable	M	SD	M	SD	F
Age	40.65	11.70	40.22	9.57	0.46
Socioeconomic status	53.89	13.53	54.90	14.08	0.14
Social stability	1.08	0.80	1.00	0.79	0.27
Number of arrests	6.08	15.99	5.51	9.96	0.59
Age of onset	25.89	9.98	23.30	6.86	2.83*
Parents problem drinkers	1.54	0.51	1.52	0.50	0.35
Longest previous period of sobriety	13.70	15.10	11.39	22.39	0.33
Number of previous admissions	2.78	1.53	3.28	1.74	2.27
Previous A.A. attendance	1.70	0.46	1.54	0.50	2.73
Withdrawal symptoms	2.54	1.12	3.11	1.10	7.02***
Overall mental health (MMPI Ip)	4.06	1.98	4.06	2.08	0.17
Overall mental health (ISB)	157.02	18.88	157.18	16.57	0.20
Neuroticism (MMPI)	196.24	37.21	198.63	34.68	0.12
Depression (rating)	4.22	1.25	4.20	1.15	0.49
Obsessive compulsive (MMPI Pt)	68.81	15.95	68.17	14.09	0.51
Antisocial (MMPI Pd)	74.38	12.02	78.29	8.99	4.05**
Anger (rating)	4.00	1.39	4.42	1.09	3.32*
Schizophrenia (MMPI signs)	3.00	1.49	3.07	1.53	0.50
IQ	100.00	10.31	98.44	12.19	0.47
Defensiveness (MMPI K)	46.49	7.84	47.16	8.65	0.17

Note. $n = 127$

*$p < .10$.

**$p < .05$.

***$p < .01$.

8, along with the related F-ratios. Inspection of Table 8 reveals that treatment successes and failures differ very little on most of the predictor variables. However, it is noted that treatment successes report fewer withdrawal symptoms in their histories and score significantly lower on the MMPI Pd scale than treatment failures. In an insignificant but noteworthy trend, patients with successful outcomes are rated as having somewhat less of a problem with excessive anger upon admission than those with unfavorable outcomes. There is also a trend for successes to report a later age at onset of alcoholism than failures, but because of lack of replication in other analyses, this is viewed as a chance finding.

Second, the relationships between each of the predictor variables and the dichotomous outcome measure excluding lost subjects are examined. The means and standard deviations of the "success" and "failure" groups of patients, along with associated F-ratios, appear in Table 9.[3] As is the case with Table 8, inspection of Table 9 reveals that treatment successes and failures differ very little on most of the predictor variables. But, for this measure of treatment outcome, successes again report fewer withdrawal symptoms in their histories than do failures, and successes are rated as having less of a problem with excessive anger than are failures. Although the results for the MMPI Pd scale show the same directionality as in Table 7 (i.e., successes are less antisocial than failures), they fail to achieve statistical significance, in part because of the reduced sample size.

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[3]Note that the means and standard deviations for successes are identical in Tables 8 and 9, as they refer to the same group of subjects. The statistics for failures differ across the two tables, however, due to the different conventions for classifying lost subjects. The same holds true for the top and bottom halves of Table 10.

Table 9

Means and Standard Deviations of Treatment Successes and Failures on 20 Predictor Variables, Lost Subjects Excluded

	Successes		Failures		
Predictor Variable	M	SD	M	SD	F
Age	40.65	11.70	39.48	9.28	0.31
Socioeconomic status	53.89	13.53	54.88	12.78	0.14
Social stability	1.08	0.80	1.08	0.85	0.98
Number of arrests	6.08	15.99	5.79	10.51	0.13
Age of onset	25.89	9.98	23.35	6.82	2.34
Parents problem drinkers	1.54	0.51	1.61	0.49	0.41
Longest previous period of sobriety	13.70	15.10	10.26	21.73	0.73
Number of previous admissions	2.78	1.53	3.12	1.56	1.12
Previous A.A. attendance	1.70	0.46	1.58	0.50	1.62
Withdrawal symptoms	2.54	1.12	3.15	1.11	7.11**
Overall mental health (MMPI Ip)	4.06	1.98	4.14	2.17	0.41
Overall mental health (ISB)	157.03	18.88	157.65	16.72	0.30
Neuroticism (MMPI)	196.24	37.21	198.24	35.79	0.72
Depression (rating)	4.22	1.25	4.23	1.20	1.20
Obsessive compulsive (MMPI Pt)	68.81	15.95	68.14	13.87	0.50
Antisocial (MMPI Pd)	74.38	12.02	77.64	8.54	2.56
Anger (rating)	4.00	1.39	4.55	1.06	5.00*
Schizophrenia (MMPI signs)	3.00	1.49	3.18	1.54	0.34
IQ	100.00	10.31	98.48	11.35	0.45
Defensiveness (MMPI K)	46.49	7.84	46.89	8.29	0.59

Note. $n = 103$.
*$p < .05$.
**$p < .01$.

Four predictor variables were selected which exhibited the strongest, most consistent relationships with the two dichotomous outcome measures in both the bivariate analyses of this hypothesis and the multivariate analyses of hypothesis 2. These variables are withdrawal symptoms, previous A.A. attendance (important in the subsequent multivariate analyses but not in the bivariate analyses here), the MMPI Pd scale, and anger. The relationships between each of these four variables and each of the two dichotomous outcome measures are reexamined with only these four variables entered into the analyses, thereby resulting in significantly increased sample sizes.[4] The resulting means and standard deviations of treatment successes and failures on these four selected predictor variables, for each of the two dichotomous outcome measures, appear in Table 10. When lost subjects are categorized as treatment failures, successes report fewer withdrawal symptoms and score lower on the MMPI Pd scale than failures. Again, there is a trend for successes to be less angry upon admission than failures. When subjects lost to follow-up are excluded from the analyses, successes report fewer withdrawal symptoms, score lower on the MMPI Pd scale, and are rated as having less problem with excessive anger. Of particular interest in the latter reanalysis (with lost subjects excluded) is that the MMPI Pd scale, which fails to achieve significance when all 20 predictors are entered, shows a highly significant difference between treatment successes and failures with the increased sample size.

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[4]The bivariate analyses regarding dichotomous criterion variables were performed by the same computer program which performed the multivariate analyses. Therefore, a case with missing data on any one of the predictor variables entered into the analyses was excluded from the analyses.

Table 10

Means and Standard Deviations of Treatment Successes and Failures on Four Selected Predictor Variables

	Successes		Failures		
Predictor Variable	M	SD	M	SD	F
Lost Subjects Included as Failures[a]					
Withdrawal symptoms	2.56	1.07	3.03	1.10	6.10**
Previous A.A. attendance	1.62	0.49	1.52	0.50	1.54
Antisocial (MMPI Pd)	72.56	11.67	78.51	10.06	10.57***
Anger (rating)	4.10	1.32	4.43	1.04	2.73*
Lost Subjects Excluded from Analysis[b]					
Withdrawal symptoms	2.56	1.07	3.06	1.12	6.21**
Previous A.A. attendance	1.62	0.49	1.54	0.50	0.85
Antisocial (MMPI Pd)	72.56	11.67	78.05	10.20	7.90***
Anger (rating)	4.10	1.32	4.52	1.00	4.07**

[a] $n = 158$.

[b] $n = 131$.

*$p = .10$.

**$p < .05$.

***$p < .01$.

Finally, the relationships between each of the predictor variables and the numerical, 0 to 4 rating of treatment outcome is considered for the subsample of subjects who completed and returned follow-up questionnaires. Because the criterion variable in this set of analyses is numerical, Pearson correlation coefficients were computed between each predictor variable and the outcome measure. These correlations appear in Table 11.[5] None of the 20 correlation coefficients in Table 11 differ significantly from zero. Among treated alcoholics who return follow-up questionnaires, then, there are no relationships between any of the 19 predictor variables and treatment outcome. The failure to find significant relationships between any predictor variables and the numerical measure of outcome may be due in part to the favorably biased nature of the sample.

Based on the findings presented above, the following conclusions are offered regarding Hypothesis 1. When treatment outcome is dichotomized into categories of "success" and "failure," for alcoholics receiving long-term residential treatment about whom follow-up information can be obtained or assumed, successes report fewer withdrawal-type symptoms (blackouts, tremors, D.T.'s, hallucinosis, seizures) than failures, which suggests that their physical addictions to alcohol are less severe. Successes are less antisocial upon admission, as measured by the MMPI Pd scale, than failures. Successes may be rated

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[5]The computer program performed the simple correlational analysis for each predictor variable independently of the analysis for each other predictor variable. The sample sizes therefore differ slightly for the various predictor variables, depending on how may cases were missing data on each variable.

Table 11

Pearson Correlations between Predictor Variables and Numerical Rating of Treatment Outcome

Predictor Variable	n	r
Age	52	.01
Socioeconomic status	52	-.04
Social stability	51	.14
Number of arrests	51	.03
Age of onset	51	.14
Parents problem drinkers	52	.05
Longest previous period of sobriety	40	.30
Number of previous admissions	52	-.17
Previous A.A. attendance	45	.22
Withdrawal symptoms	52	-.11
Overall mental health (MMPI Ip)	49	-.25
Overall mental health (ISB)	47	-.03
Neuroticism (MMPI)	49	-.07
Depression (rating)	52	.20
Obsessive compulsive (MMPI Pt)	49	-.07
Antisocial (MMPI Pd)	49	-.10
Anger (rating)	52	-.09
Schizophrenia (MMPI signs)	49	-.10
IQ	50	.26
Defensiveness (MMPI K)	49	-.09

Note. $p > .05$ for all correlation coefficients.

as having less problem with excessive anger upon admission than failures: The data on this point are strongly suggestive but not conclusive. Successes and failures do not differ with regard to age, socioeconomic status, social stability, number of arrests, age of onset of drinking problem, problem drinking by their parents, length of longest previous period of sobriety, number of previous admissions for alcoholism, previous A.A. attendance, overall mental health, neuroticism, depression, obsessive compulsive traits, schizophrenia, IQ, or defensiveness. Among alcoholics who return follow-up questionnaires, none of the predictor variables investigated here are related to a numerical measure of treatment success, perhaps because questionnaire respondents are a select, nonrepresentative group among treated alcoholics.

Hypothesis 2: Successful outcome from long-term residential treatment among male alcoholics cannot be predicted by any combination of predictor variables. As is the case with hypothesis 1, hypothesis 2 is addressed by three data analyses, which correspond to the three measures of treatment outcome. Following presentation of the three analyses, overall conclusions pertinent to hypothesis 2 are offered.

For the two dichotomous measures of treatment outcome, predictive equations based on combinations of predictor variables were derived by stepwise discriminant analyses, with variables selected for inclusion based on maximizing the overall F-ratio for the test of differences among group centroids, and thereby minimizing Wilks' lambda. Discriminant analyses were rerun after eliminating noncontributory predictor variables in the initial analyses, thereby increasing sample sizes.

When lost subjects were categorized as failures, the most effective prediction of treatment success versus failure was achieved by a

discriminant function comprised of six predictor variables, listed in descending order of relative contribution to the function: MMPI Pd scale, number of withdrawal sumptoms, Incomplete Sentences Blank score, number of previous admissions for alcoholism, anger ratings, and previous regular A.A. attendance. To confirm the relative contribution of each of these variables to the function, the reader may refer to the standardized canonical discriminant function coefficients in Table 12. A canonical correlation coefficient of .38 is achieved between this function and dichotomous treatment outcome, lost subjects classified as failures ($p < .001$). The classification function coefficients in Table 11 are used to predict the outcome of individual cases.[6] Using these classification functions, 67.95% of the sample of 156 subjects were correctly classified regarding their treatment outcome. Of subjects predicted to be treatment successes, 29.4% are failures in actuality (false positives). Of subjects predicted to be treatment failures, 38.3% are actually successes (false negatives).

The discriminant anslysis for dichotomous outcome, lost subjects categorized as failures, was reperformed using four of the six predictor variables in the above analysis. The four variables (withdrawal symptoms, previous A.A. attendance, MMPI Pd scale, and anger rating) are those which are also contributory to the multivariate prediction of

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[6]The classification function coefficients are presented in Tables 12, 13, and 14, in case the reader wishes to apply the discriminant functions derived in this study to predict the outcome of another group of treated alcoholics. For each group ("success" and "failure"), a subject's raw score on each predictor variable is multiplied by the respective classification function coefficient, the products are summed, and the constant is added. The subject is then predicted to be a success if his "success" score is higher than his "failure" score, and is expected to be a failure if his "failure" score exceeds his "success" score.

Table 12

Six-Variable Discriminant Function to Predict

Dichotomous Outcome, Lost Subjects Included as Failures

Predictor Variable	Standardized Canonical Discriminant Function Coefficients	Classification Function Coefficients	
		Successes	Failures
Withdrawal symptoms	0.4690	0.4991	0.8774
Previous A.A. attendance	-0.3033	6.8124	6.2782
MMPI Pd scale	0.7453	0.3425	0.4041
Anger rating	0.3164	2.9254	3.1698
ISB	-0.4196	0.4226	0.4014
No. of previous admissions	0.3460	0.5109	0.6950
(Constant)		-59.1427	-62.2697

Note. $n = 156$. Criterion variable has value of "1" for treatment failure or lost to follow-up, and "2" for treatment success.

the second dichotomous outcome measure, to be described below. The discriminant function based on these four variables is almost as efficacious in predicting treatment outcome as the function employing six predictors. In Table 13, the standardized canonical discriminant function coefficients indicate that the MMPI Pd scale is again the strongest contributor to the function, followed by number of withdrawal symptoms, previous regular A.A. attendance, and anger rating. A canonical correlation coefficient of .34 is obtained between this four-variable function and the dichotomous outcome measure, lost subjects categorized as failures ($p = .001$). Use of the classification function presented in Table 13 accurately predicts the treatment outcome of 67.72% of the 158 alcoholics in the sample. Of subjects predicted to be treatment successes, 30.3% are in fact failures (false positives), and of subjects predicted to be failures, 37.5% are actually successes (false negatives). These data indicate that significant prediction of treatment success versus failure (lost subjects considered to be failures) is achieved by both a four-variable discriminant function including antisocial traits, withdrawal symptoms, previous A.A. attendance, and anger, and by a six-variable discriminant function including these four predictors, overall mental health (ISB), and number of previous admissions.

When the dichotomous outcome measure excluding lost subjects is considered, a four-variable discriminant function produces the most accurate prediction. From the standardized canonical discriminant function coefficients appearing in Table 14, it can be seen that the predictor most contributory to this function is again the MMPI Pd scale, followed in order by number of withdrawal symptoms, anger rating,

Table 13

Four-Variable Discriminant Function to Predict Dichotomous Outcome, Lost Subjects Included as Failures

Predictor Variable	Standardized Canonical Discriminant Function Coefficients	Classification Function Coefficients	
		Successes	Failures
Withdrawal symptoms	-0.5083	1.3041	1.6637
Previous A.A. attendance	0.3388	6.0561	5.5325
MMPI Pd scale	-0.6974	0.6092	0.6600
Anger rating	-0.3066	3.1876	3.3964
(Constant)		-35.9276	-40.8355

Note. n = 158. Criterion variable has value of "1" for treatment failure or lost to follow-up, and "2" for treatment success.

Table 14

Discriminant Function to Predict Dichotomous Outcome, Lost Subjects Excluded

Predictor Variable	Standardized Canonical Discriminant Function Coefficients	Classification Function Coefficients	
		Successes	Failures
Withdrawal symptoms	0.5282	0.9856	1.3399
Anger rating	0.3846	2.9526	3.2037
Previous A.A. attendance	-0.2774	6.0999	5.6875
MMPI Pd scale	0.6145	0.5691	0.6113
(Constant)		-33.6201	-38.2225

Note. n = 131. Criterion variable has value of "1" for treatment failure and "2" for treatment success.

and previous regular A.A. attendance. A canonical correlation of .34 is obtained between this discriminant function and the dichotomous outcome measure which excludes lost subjects from the analysis ($p < .01$). Application of the classification function coefficients in Table 14 produces 70.23% accurate classification of treatment successes and failures among the 131 subjects in the sample. Of subjects predicted to be treatment successes, 27.7% are actually failures (false positives). Of those expected to be failures, 33.3% are in reality treatment successes (false negatives). Treatment success versus failure (lost subjects excluded) can be predicted by a four-variable discriminant function based on antisocial traits, withdrawal symptoms, anger, and previous regular A.A. attendance.

While the second dichotomous outcome measure excluded subjects completely lost to follow-up, the first dichotomous outcome measure is based on the assumption that subjects lost to follow-up are treatment failures. The validity of that assumption is statistically tested in this study. The four-variable discriminant function in Table 14, derived from data on subjects about whom first- or secondhand follow-up information could be obtained, is used to predict the treatment outcome of the 27 subjects who were lost to follow-up.[7] This analysis predicts that 70.4% of the lost subjects are treatment failures, while 29.6% of lost subjects would be expected to be successes. The percentage of lost subjects predicted to be successes is somewhat larger than Adamson et al.'s (1974) prediction of a 21.4% success rate for lost subjects, which was based on a smaller sample. That 29.6% of lost subjects in this

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[7]Those lost subjects with data on the nucessary predictor variables.

study are predicted to be successes casts doubt on the validity of the assumption that lost subjects may be categorized as treatment failures. The results pertinent to the dichotomous outcome measure excluding lost subjects, then, are to be given greater consideration than the results based on the outcome measure including lost subjects as failures (although in this study, the results pertinent to the two measures are quite comparable).

Finally, consideration is given to multivariate prediction of the numerical measure of treatment outcome, based on the number of the four outcome criteria met by those subjects who returned follow-up questionnaires. A stepwise multiple regression analysis produces a regression equation utilizing five predictor variables, listed in descending order of relative contribution to the prediction: schizophrenia (MMPI signs), length of longest previous period of sobriety, overall mental health (ISB), age at onset of drinking problem, and anger (rating). The reader may verify the relative contribution of each predictor variable to the equation by examining the standardized beta weights presented in Table 15. The unstandardized "B" coefficients in Table 15 may be employed to predict the outcome of individual cases from raw scores on the predictor variables.[8] A multiple r of .59 is obtained between the regression equation in Table 15 and the numerical outcome measure ($p < .05$). This finding suggests that the treatment outcome (rated numerically) of follow-up questionnaire respondents can be predicted on the basis of five patient characteristics. However, the sample size is small, the sample is favorably biased, and tow pre-

[8]A subject's raw score on each predictor variable is multiplied by the "B" coefficient for that variable, the resulting products are summed, and the constant is added.

Table 15

Regression Equation for Multivariate Prediction of

Numerical Measure of Treatment Success

Predictor Variable	Beta	B
Age of onset	.3219	.4602
Longest previous period of sobriety	.4431	.4522
Schizophrenia (MMPI signs)	.5408	.4515
Overall mental health (ISB)	-.3914	-.3310
Anger rating	.1742	.1813
(Constant)		4.3498

Note. $n = 34$. Criterion variable assumes whole number values from 0 through 4, with 4 indicating treatment success and lower values signifying less favorable outcomes. Multiple $r = .59$, $p < .05$.

dictors (schizophrenia and anger) show a change of direction of relationship with outcome compared with their zero-order correlations. Therefore, the significance of the prediction equation should be regarded as tentative in the absence of cross-validation on a larger, less biased sample.

Based on the findings reported above, the following conclusions are offered regarding hypothesis 2. When treatment outcome is dichotomized into "success" versus "failure" categories, discriminant functions based on four predictor variables (MMPI Pd scale, number of withdrawal symptoms, anger rating, and previous regular A.A. attendance) significantly discriminate between treatment successes and failures. When lost subjects are excluded from the analysis, the discriminant function produces 70.23% correct classification of outcome. When lost subjects are categorized as treatment failures, the other discriminant function produces 67.72% correct classification. The percentage of correct classification when lost subjects are considered failures increases to 67.95% when two additional predictor variables (number of previous admissions for alcoholism treatment, overall mental health as measured by ISB score) are included in the discriminant function. However, the validity of the practice of considering lost subjects to be treatment failures is questionable in light of the finding that 29.6% of subjects lost to follow-up in this study are predicted to be treatment successes.

When treatment outcome is measured on a 0 to 4 scale based on the number of outcome criteria met by subjects returning follow-up questionnaires, a five-variable regression equation correlates .59 with outcome. This correlation is considerably higher than the canonical correlations

of approximately .34 obtained between discriminant functions and dichotomous outcome measures, suggesting that the numerical outcome measure can be predicted more accurately than the dichotomous outcome measures. However, this conclusion is weakened by three factors. First, the sample on which the regression analysis is based is quite small ($n = 34$). Second, the sample represents the favorably biased subset of treated alcoholics who return follow-up questionnaires. Third, examination of the beta coefficients in Table 15 reveals that two of the predictor variables make contributions to the prediction equation in the opposite direction from that which would be expected. Surprisingly, individuals who are more schizophrenic and more angry are predicted to have more favorable outcomes, other variables being equal. The finding that alcoholics' scores on the numerical outcome measure can be predicted by a five-variable regression equation must be regarded as suggestive and extremely tentative, rather than conclusive.

Hypothesis 3: There are no relationships between any of 19 predictor variables and length of stay in a long-term residential treatment program among male alcoholics.

Pearson's correlation coefficients between each predictor variable and number of days in treatment were computed. The number of subjects differs somewhat among the analyses, because the number of cases with missing data on each predictor variable varies. The Pearson's correlation coefficient between each predictor variable and number of days in treatment, along with the associated number of subjects in the analysis, appears in Table 16. Inspection of Table 16 reveals that all of the correlation coefficients are small in magnitude. The only correlation which differs significantly from zero is that between IQ and number of

Table 16

Pearson Correlations between Predictor Variables and Length of Stay in Treatment

Predictor Variable	n	r
Age	265	-.01
Socioeconomic status	265	.01
Social stability	260	.02
Number of arrests	261	.11
Age of onset	262	-.02
Parents problem drinkers	246	-.07
Longest previous period of sobriety	227	.02
Number of previous admissions	263	-.11
Previous A.A. attendance	238	.00
Withdrawal symptoms	264	-.07
Overall mental health (MMPI Ip)	227	-.06
Overall mental health (ISB)	224	-.05
Neuroticism (MMPI)	227	.00
Depression (rating)	258	.00
Obsessive compulsive traits (MMPI Pt)	227	.03
Antisocial (MMPI Pd)	227	-.06
Anger (rating)	258	-.06
Schizophrenia (MMPI signs)	227	.02
IQ	233	.14*
Defensiveness (MMPI K)	227	-.01

*$p < .05$.

days in treatment, $r = .14$, $p < .05$. It appears, then, that more intelligent alcoholics tend to remain in long-term residential treatment longer than their less intelligent counterparts. However, that IQ is the only "significant" variable among 20 predictors, and that IQ was not consistently related to length of stay in previous research, implies that this relationship between IQ and length of stay is a chance finding. There are no relationships between length of stay in long-term treatment and: age, socioeconomic status, social stability, number of arrests, age of onset of drinking problem, problem drinking by patients' parents, length of longest previous period of sobriety, number of previous admissions for alcoholism treatment, previous regular A.A. attendance, number of withdrawal symptoms in history, overall mental health (either objectively or projectively measured), neuroticism, depression, obsessive compulsive traits, antisocial personality, anger, schizophrenia, or defensiveness.

Hypothesis 4: Length of stay in a long-term residential treatment program among male alcoholics cannot be predicted by any combination of predictor variables.

An initial stepwise multiple regression procedure was performed in which all 20 predictor variables were entered into the analysis. After 12 predictor variables were entered, the inclusion of additional variables failed to significantly improve the prediction of number of days in treatment. In order to increase sample size, the stepwise multiple regression was reperformed, entering the 12 contributory predictor variables from the initial regression. In this reanalysis, significant increments to predictive power ceased to occur after the inclusion of nine predictors.

The nine predictor variables in the resulting regression equation, listed in descending order of relative contribution, are: IQ, number of arrests, defensiveness (MMPI K scale), number of previous admissions for alcoholism treatment, problem drinking by patients' parents, social stability, anger (rating), overall mental health (ISB), and number of withdrawal symptoms in history.[9] The relative contributions of the predictors can be verified by inspection of the standardized beta coefficients for the various variables, which appear in Table 17. The directionality of the contribution of each variable to the prediction of length of stay in treatment can be inferred from the signs of the beta coefficients. The only one of the nine variables which contributes in the opposite manner from that expected is number of arrests: Other things being equal, an alcoholic with more arrests in his history is predicted to remain in treatment longer. The unstandardized B coefficients, for use in predicting number of days in treatment from raw scores on the nine predictor variables, also appear in Table 17. The regression equation comprised of these B coefficients correlates .34 with number of days in treatment, $p < .01$.

Relative to hypothesis 4, then, it is concluded that among alcoholics entering a long-term residential treatment program, statistically significant prediction of length of stay in treatment can be made by the use of a regression equation comprised of nine predictor variables.

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[9]The three predictor variables which were included in the original regression but dropped from the reanalysis are antisocial personality (MMPI Pd scale), schizophrenia (MMPI psychotic signs), and depression (rating).

Table 17

Regression Equation for Multivariate Prediction of Number of Days in Treatment

Predictor Variable	Beta	B
Withdrawal symptoms	-.0820	-8.2386
IQ	.1983	1.9272
MMPI K scale (defensiveness)	-.1397	-1.8791
ISB (overall mental health)	-.0835	-0.5254
Social stability	.1108	15.0524
No. of arrests	.1447	1.6262
No. of previous admissions	-.1311	-8.8615
Parents problem drinkers	-.1211	-25.8506
Anger (rating)	-.0973	-8.9203
(Constant)		266.6119

Note. $n = 199$. Multiple $r = .34$, $p < .01$.

Incidental Findings

Several isolated, incidental findings are reported here. The reasons for reporting these particular findings will become clear in the discussion chapter. Very little correlation is found between ratings of excessive anger and the MMPI Pd scale, $r = .03$, $n = 158$, $p > .05$. Little relationship exists between withdrawal symptoms and the MMPI K scale, $r = .05$, $n = 199$, $p > .05$.

In the literature review section of this dissertation, several speculations were made regarding the relationship between treatment outcome and history of regular A.A. involvement which has been reported in the literature. Three findings are reported here which have bearing on those speculations. The Pearson's correlation between previous regular A.A. attendance and social stability is .04, $n = 164$, $p > .05$. The Pearson's correlation between previous regular A.A. attendance and length of longest previous period of sobriety is .17, $n = 164$, $p < .05$. As can be seen in Table 16, the correlation between previous regular A.A. attendance and length of stay in treatment is .00, $n = 238$, $p > .05$. The implications of these correlations are discussed in the following chapter.

Summary and Conclusions

The general purposes of this study were to identify demographic, social history, drinking history, and personality characteristics of male chronic alcoholics entering a long-term treatment program which were related to successful treatment outcome and length of stay in treatment, to develop formulae for predicting treatment outcome and length of stay in treatment, and to assess the accuracy and significance of these formulae in predicting treatment outcome and length of stay

in treatment. To address these purposes, four hypotheses were stated and tested.

Three SPSS computer programs were utilized in performing the statistical analyses necessary to test the hypotheses of this study: Discriminant Analysis, Pearson Correlation, and Multiple Regression. Sample sizes vary across the different analyses, according to the number of cases with data on the four criterion variables and the number of cases deleted for missing data on crucial predictor variables. It is statistically demonstrated that the practice of omitting cases for missing data does not bias the analyses regarding the three measures of treatment outcome, but does bias the analyses regarding length of stay in treatment in the direction of excluding subjects who left treatment after a very brief stay. Multivariate analyses were reperformed after deleting noncontributory predictor variables, in order to increase sample sizes.

Treatment outcome was assessed in three ways: (1) a dichotomous, success versus failure measure in which subjects lost to follow-up were assumed to be failures, (2) a dichotomous, success versus failure measure in which lost subjects were excluded from the analysis, and (3) a numerical measure, varying in value from 0 to 4, based on the number of outcome criteria met by subjects who returned 6-month follow-up questionnaires. The prediction that 29.6% of subjects lost to follow-up would have favorable outcomes suggests that excluding lost subjects from the analysis is a more valid procedure than assuming them to be failures, which in turn suggests that the second dichotomous outcome measure is more valid than the first.

Hypothesis 1: There are no relationships between any of 19 predictor

variables and successful outcome from long-term residential treatment among male alcoholics. When outcome among treated alcoholics about whom first- or secondhand information could be obtained is dichotomized into "success" versus "failure" categories, treatment success is related to fewer withdrawal symptoms in patients' histories, less sociopathy, and, possibly, less problem with excessive anger. There are no relationships between treatment outcome and 16 other predictor variables. Among treated alcoholics who return follow-up questionnaires, number of treatment success criteria met is not related to any of the predictor variables. However, because this latter finding is based on a small, select subsample of subjects who tend to have favorable outcomes (hence the variability in outcome is reduced), the results pertaining to the dichotomous outcome measure are considered more informative, and hypothesis 1 is generally rejected.

Hypothesis 2: Successful outcome from long-term residential treatment among male alcoholics cannot be predicted by any combination of predictor variables. A discriminant function comprised of four predictor variables (MMPI Pd scale, number of withdrawal symptoms, anger rating, and previous regular A.A. attendance) correctly classifies 70.23% of subjects into "success" versus "failure" categories, lost subjects excluded. The canonical correlation between the function and treatment outcome is .34, $p < .01$. Of predicted failures, 33.3% are false negatives. For the numerical outcome measure, an eight-variable regression equation correlates .77 with outcome, $p < .01$. Hypothesis 2, then, is rejected.

Hypothesis 3: There are no relationships between any of 19 predictor variables and length of stay in a long-term residential treatment

program among male alcoholics. A small but statistically significant relationship is noted in which more intelligent alcoholics remain in treatment longer than alcoholics with lower IQ's. There are no relationships between length of stay in treatment and 18 other predictor variables. Hypothesis 3 is rejected, based on the one significant relationship. However, it is noted that the overwhelming majority of predictor variables tested are unrelated to length of stay in treatment, and the possibility is entertained that the apparent relationship between IQ and length of stay is a chance finding.

Hypothesis 4: Length of stay in a long-term residential treatment program among male alcoholics cannot be predicted by any combination of predictor variables. A nine-variable regression equation correlated .34 with number of days in treatment, $p < .01$. Hypothesis 4 is rejected on the basis of this weak but statistically significant finding.

All four null hypotheses, then, are rejected on the basis of statistical findings. The practical significance of the findings, however, varies greatly, as is discussed in the following chapter.

DISCUSSION

This study was designed to determine which patient characteristics, measurable at admission, are related to treatment outcome and length of stay in treatment in long-term residential alcoholism rehabilitation, and to determine the efficacy of predicting treatment outcome and length of stay on the basis of patient characteristics. The study was undertaken with the rationale of fostering efficient utilization of treatment resources by comparing the characteristics of male alcoholics who fare well in the long-term residential program studied here with the characteristics of male alcoholics who respond favorably to the shorter treatment programs examined in previous research.

It is concluded that less antisocial male alcoholics are more likely to achieve abstinence and adequate social adjustment after long-term inpatient treatment than those who are more antisocial. This finding is consistent with the previous literature, suggesting that the strong negative effect of sociopathy on alcoholism treatment outcome applies to long-term as well as short-term programs. The tentative conclusion is offered that the negative relationship between excessive anger and alcoholism treatment success found often in the literature applies to long-term treatment as well. A negative relationship was tentatively found here between excessive anger and treatment success despite the fact that no attempt was made to isolate the definitive characteristics of "excessive anger," but rather, the variable was assessed by means of rehabilitation counselors' clinical judgments. Whatever it is that counselors perceive as problematic, excessive anger seems to be related to alcoholism treatment outcome. A possible avenue

for future research is to isolate the defining characteristics of counselor's judgments of excessive anger in patients. That the anger ratings in this study were not related to subject's MMPI Pd scores suggests that the raters were not reacting to an aspect of the anti-social personality when rating anger.

A strong treatment emphasis at Independence House is on long-term, professionally directed group psychotherapy, intended to alter the underlying personality disorders of chronic alcoholics. Despite this emphasis, alcoholics with severe antisocial personalities or characterological anger are unlikely to benefit substantially from the program. It appears, then, that even the intensive group therapy at Independence House is relatively unsuccessful at altering severe personality disorders. This implication could be experimentally verified by a study of the effects of the program on antisocial traits and excessive anger, using a pretest-posttest design.

A surprising finding in the present study is that a self-reported history of a wide array of withdrawal-type symptoms in patients' histories is related to treatment failure. The speculation could be offered that because number of withdrawal symptoms was measured by self-report, the variable reflects lack of defensiveness and exaggeration of symptoms. However, the low correlation between withdrawal symptoms and the MMPI K scale casts doubt on this speculation. Histories of withdrawal symptoms were among the less consistent predictors of outcome (among those predictors selected for study here) in previous studies of shorter-length programs. The surprising predictive power of withdrawal symptoms here may be due to the way in which the variable was measured in this study. Other researchers have typically assessed the presence versus

absence of various individual withdrawal symptoms and syndromes, while here, a numerical count was made of the number of different withdrawal symptoms and syndromes which patients reported in their histories. Perhaps the presence of specific symptoms and syndromes varies idiosyncratically across alcoholics, while a tally of the range of symptoms an alcoholic has experienced provides a better measure of degree of physical addiction. If this is true, the present study implies that alcoholics with severe physical addictions have poor treatment outcomes. Even the prolonged enforced abstinence of a 6- to 12-month residential program is apparently unsuccessful at overcoming the craving for alcohol in a severely addicted alcoholic.

In this study, no relationship is found between a history of previous regular A.A. attendance and treatment success, suggesting that the positive predictive effect of previous A.A. involvement often found in previous research does not apply to long-term residential treatment programs. However, several incidental findings regarding this variable may shed light on the reason for its predictive effect in previous studies. First, no relationship is found between previous A.A. attendance and length of stay in treatment. The literature review produced no evidence that the effect of previous A.A. involvement and length of stay has been investigated prior to the present study. The nonrelationship found here suggests that the predictive effect of previous A.A. involvement found in other studies was not due to a history of regular A.A. attendance reflecting a motivation to persist in and benefit from treatment, contrary to the speculation of Baekeland et al. (1971). Second, the lack of a significant relationship between previous regular A.A. attendance and social stability tends to invalidate the hypothesis

that the most stable alcoholics attend A.A. most consistently, and that the predictive effect of previous A.A. attendance was thus an artifact of the predictive effect (in previous studies) of social stability, as might be expected. Finally, in the present study, there is a small but significant relationship between previous A.A. attendance and length of longest previous period of sobriety. The implication here is that the supportive and/or teaching effects of A.A. have assisted alcoholics in achieving some periods of sobriety, and these treatment-like effects may have augmented the benefits of treatment programs studied in previous research, to produce a positive predictive effect from previous A.A. involvement. This implication is consistent with the discovery (in the literature review) that in the past, previous A.A. attendance has predicted abstinence but not social adjustment. The magnitude of the relationship between previous regular A.A. attendance and length of longest previous period of sobriety, however, is quite small, and most of the often-found relationship between previous A.A. involvement and treatment outcome remains unexplained. In addition, it must be stressed that no relationship was found here between previous regular A.A. attendance and treatment outcome, and the practice of applying incidental findings from this study to main findings from other studies is of course a highly speculative endeavor. The discussion in this paragraph should be regarded as suggestive of avenues for future research.

This study revealed no relationship between neuroticism and alcoholism treatment outcome. Neuroticism was assessed here against a background of lack of neuroticism, rather than against a background of other forms of psychopathology (e.g., neurotic vs. psychotic vs. per-

sonality disordered). The finding can be taken to support the conclusion from the literature review that neuroticism per se is unrelated to alcoholism treatment outcome, and that predictive effects of neuroticism in other studies were artifacts of the fact that a diagnosis of neurosis implied the absence of personality disorder or psychosis. However, it is suggested that this conclusion be verified by a replication employing a better-validated measure of neuroticism than is used here.

Depression was also assessed as a "pure" variable in the present study, and the expectation was that depressed alcoholics would have poor prognoses. However, no relationship is found between depression and treatment outcome. Either the negative predictive effect of depression does not apply to long-term residential alcoholism treatment, or else rehabilitation counselors were unable to rate degree of depression in a valid manner. The latter speculation is suspect, in that the counselor's similarly-performed ratings of anger are probably predictive of outcome. If the former speculation is adopted, a comparison of pre- and posttreatment ratings of depression could determine whether the length of the treatment at Independence House allows for more successful treatment of depressive problems than is the case in shorter programs, thereby eliminating the predictive effect of the variable on outcome.

Patients' socioeconomic status is unrelated to treatment outcome in the present study. This nonrelationship confirms the remarks made by Willems et al. (1973) that the predictive effects of socioeconomic status on alcoholism treatment outcome diminish as program length increases. Social stability, one of the most consistent predictors of treatment success in previous research, is unrelated to treatment outcome in the present study. Number of arrests is also unrelated to treatment

outcome at Independence House. The lack of predictive effects from these social functioning variables suggests that the program length causes a significant disruption of an alcoholic's social decline and that the required part-time employment facilitates social reintegration.

The present study reveals no relationships between alcoholism treatment outcome and age at admission or obsessive compulsive traits. Taken in combination, these findings suggest that the general principle (from previous research) that more rigid alcoholics (in terms of personality) are most likely to achieve abstinence following treatment does not apply to the long-term alcoholism treatment offered at Independence House. Perhaps rigidity is an asset in short-term therapy aimed at strengthening defenses, but is not an asset in the long-term, intensive group psychotherapy at Independence House, which focuses on altering maladaptive personality traits and behavior patterns.

No relationship is found between overall mental health and treatment outcome, even though two separate measures of mental health are used. Overall mental health was (according to previous research) one of the weaker predictor variables of those employed here, and its lack of significance is not surprising. In addition, no relationships are found between treatment outcome and: number of arrests, age at onset of drinking problem, problematic drinking by patients' parents, length of longest previous period of sobriety, number of previous admissions for alcoholism treatment, latent schizophrenia, IQ, or defensiveness. The conclusion is offered that the predictive effects of these variables do no apply to long-term residential alcoholism treatment. Replication of these nonrelationships is suggested.

When treatment outcome is rated numerically among the select,

favorably biased subsample of treated alcoholics who return follow-up questionnaires, some predictor variables are related to outcome with correlation coefficients as high as .30. However, in part because of the small sample size, none of these relationships achieve statistical significance. Even if the relationships had been significant, interpretation of the results would have been rendered difficult because of the favorably biased nature of the subsample. For future research, an investigator may wish to attempt to obtain more detailed follow-up data on all treated alcoholics, rather than just those who return questionnaires. This type of research could better determine the efficacy of rating treatment outcome numerically, and could permit analysis of which factors affect different aspects of treatment outcome (e.g., abstinence vs. vocational adjustment vs. conformity to societal norms).

At the conclusion of the literature review, a 19-variable profile of the alcoholic who is likely to benefit from treatment was offered. Based on the results of this study, the male alcoholic who is likely to benefit from long-term residential treatment can be profiled on three variables: He is not antisocial; he does not report a wide array of alcoholic withdrawal-type symptoms in his history (i.e., his physical addiction to alcohol is not severe); and (tentatively), he is not rated as having a severe problem with excessive anger.

The conclusion is offered here that outcome following long-term residential alcoholism treatment can be predicted on the basis of patient characteristics measurable at admission. The 70.23% rate of correct classification of treatment outcome obtained from a four-variable discriminant function is well within the general range of classification

rates obtained in previous research. A correlation coefficient of .59 is obtained when a five-variable multiple regression equation is used to predict the numerical outcome measure among treated alcoholics who return follow-up questionnaires, despite the relatively low variance in outcome among this group. However, this latter finding is based on data from a small, favorably biased subsample of alcoholics, and it needs replication and cross-validation on a larger, less select sample.

Although statistically significant prediction of treatment outcome is achieved, the practical significance of the findings requires discussion. Statistically speaking, the treatment failure rate at Independence House in the patient sample studied here is 64.6% (excluding subjects lost to follow-up). The correct classification rate of 70.23% which is obtained by the discriminant function represents only a 5.6% increase in accuracy over that which would be obtained by predicting every patient to be a treatment failure. In a more practical consideration, if the discriminant function were to be used to select patients for admission to Independence House, replacing the current clinical criteria, the failure rate of treated alcoholics would decrease to 27.7% (the rate of false positives), which would represent a significant increase in the efficiency of utilization of the treatment resource. However, it would then be predicted that 33.3% of those refused admission would have benefited from treatment if they had been offered admission. Of course, these figures must be regarded as approximations, because potential subjects who are refused admission based on the present clinical acceptance criteria were not involved in the analyses. Nevertheless, the high false negative rate renders the use of the discriminant function as

an acceptance criterion ethically questionable, despite its potential value in increasing program utilization efficiency. Use of the multivariate findings of this study in selection of patients for treatment should be an administrative decision, weighing the significantly increased efficiency of program utilization against denying treatment to a minority of persons who would benefit.

The practical significance of the individual predictor variables which are statistically related to treatment outcome must also be considered. Treatment success is statistically related to lack of sociopathy, lack of an extensive history of withdrawal symptoms, and lack of excessive anger. However, the differences in the mean scores of treatment successes and failures on these variables is small (see Tables 8, 9, and 10). It would be difficult, for example, to detect a clinical difference between an individual scoring 73 on the MMPI Pd scale and an individual scoring 78. Rounding to the nearest whole number on the 7-point scale of excessive anger, the typical treatment success would receive a rating of 4, while the average treatment failure would be given a score of 5 (based on analyses excluding subjects lost to follow-up: See Tables 9 and 10). The small differentiation between treatment successes and failures on antisocial traits and excessive anger may be a result of reduced variance in prognosis among the Independence House population. Easily treated alcoholics probably achieve sobriety through A.A. or short-term treatment, and persons applying for admission to a long-term program may be a relatively homogeneous group of alcoholics with poor prognoses. Within this group of chronic alcoholics, there would be little variation in patient characteristics. Regarding the number of withdrawal symptoms reported

by patients, the mean scores of treatment successes and failures round to the same whole number value. Perhaps a more highly refined measure of physical addiction would produce more powerful discrimination between successes and failures. So, the statistical findings relevant to these variables permit a discussion of the interface between patient characteristics and treatment characteristics. However, the practical significance of the bivariate findings in assessing whether a given patient will benefit from treatment is questionable.

Intelligence is the only predictor variable found to be related to length of stay in treatment at Independence House. That IQ is the only one of 19 variables significantly related to length of stay is, in a sense, consistent with previous research, because length of stay has been traditionally more difficult to predict than treatment outcome. The reader is again cautioned, however, that the practice of excluding cases with missing data resulted in a favorably biased sample. This phenomenon decreased the variance in length of stay in the final sample, which may have artificially diminished the relationships between some predictor variables and length of stay. An unrelated caution should also be mentioned. Of 19 predictor variables tested, IQ is the only one "significantly" related to length of stay, and the possibility that this is a chance finding must be entertained.

Despite the above cautions, the finding that more intelligent alcoholics remain in treatment at Independence House longer can be explained conceptually. In the literature review, some evidence emerged that IQ and treatment outcome were related in previous research

because verbal therapies are most effective when patients are of at least average intelligence. Independence House is a program with a strong emphasis on verbal group psychotherapy. Perhaps less intelligent subjects drop out of treatment early because they do not perceive the primary treatment modality as being suited to their ability and needs. This speculation is contradicted by the lack of a relationship between IQ and treatment outcome in this study. Because of this consideration and the cautions mentioned in the preceding paragraph, replication is needed.

No relationship is found between length of longest period of sobriety and length of stay in treatment. In previous research, this lack of a relationship had been documented for outpatients. The present study extends the generality of the nonrelationship to long-term inpatient treatment. No relationship is found between previous regular A.A. attendance and length of stay in treatment. The relationship between these two variables had not been investigated until now, according to a fairly extensive literature review. No relationship is found between neuroticism and length of stay. This finding adds needed replication to the nonrelationship reported between these variables in previous research. In addition, this study represents the first time that the effect of neuroticism on length of stay has been investigated with neuroticism assessed as a "pure" variable, rather than as implying the lack of other, more serious psychopathological syndromes.

No relationships are found between length of stay at Independence House and: age at admission, socioeconomic status, problematic

drinking by patients' parents, withdrawal symptoms, overall mental health, obsessive compulsive traits, excessive anger, and defensiveness. These nonrelationships are not surprising, as these eight variables were relatively weak predictors, inconsistent predictors, or non-predictors of persistence in treatment in previous research.

No relationships are found between length of stay at Independence House and: social stability, number of arrests in history, age at onset of drinking problem, sociopathy, latent schizophrenia, and depression. These six variables showed at least some predictive trends in past research on length of stay in alcoholism treatment. It is possible that the predictive effects of these variables on length of stay do not apply when the treatment program is inpatient and of long duration. This is contrary to what would be expected, as a longer program should increase the variability in length of stay, which in turn should increase the effects of predictor variables. It is also possible that the favorably-biased nature of the sample reduced the variability in length of stay sufficiently to nullify the effects of some predictor variables. Regarding depression, the nonrelationship with length of stay for this variable which has been extensively studied and found predictive in the past may be due to a weakness in the measure used, as discussed previously.

The conclusion is made that prediction of length of stay in long-term residential alcoholism treatment can be made on the basis of patient characteristics measurable at admission. In previous literature, prediction equations for length of stay in treatment have been

comprised primarily of personality variables. In the present study, social and alcoholism history variables contribute more toward the prediction, perhaps as a function of the range of variables entered into the analysis. Of the nine predictor variables in the regression equation, two are social variables, three relate to aspects of patients' drinking histories, and four are psychological variables.

As was the case with the prediction of treatment outcome, a distinction should be made between statistically significant and practically significant prediction of length of stay in treatment. Only about 11.6% of the variance in length of stay in treatment is accounted for by the nine-variable regression equation. The caution has already been made that immediate dropouts tended to be excluded from the data entered into the analysis. The resulting decrease in variability in length of stay may contribute somewhat to the relatively weak prediction obtained. Nevertheless, the relatively low magnitude of the multiple correlation coefficient is consistent with previous findings, in that length of stay in treatment has historically been more difficult to predict than alcoholism treatment outcome. It appears, then, that further attempts to predict length of stay in alcoholism treatment are not likely to be fruitful. Future researchers may utilize their efforts more efficiently by investigating other possible causes of patients' leaving treatment against advice, such as patients' perceptions of various aspects of treatment programs, situational factors within treatment settings, situational factors external to treatment which could entice patients to elope, and external sources of motivation to remain in treatment. A path analysis model such as that used by Cronkite and Moos (1978) in investigating treatment outcome may shed light on the factors

influencing length of stay in treatment.

One predictor variable, number of arrests, is not related to length of stay at Independence House when considered alone, but is a part of the multivariate prediction equation for length of stay in treatment. In the regression equation, this predictor contributes in the opposite direction from that which is expected: Other variables held equal, a patient with a more extensive arrest history is likely to remain in treatment longer. It is speculated that at Independence House, patients with more extensive legal histories are under greater external pressure to remain in treatment.

It is the author's suggestion that the multivariate equations derived in this study for predicting treatment outcome and length of stay in treatment at Independence House be cross-validated on another sample of patients before they are applied as program admission criteria.

Finally, it is stressed that the findings of this study apply only to male alcoholics entering long-term residential treatment. By practical necessity, the researcher advanced the unfortunate existing trend in the literature of ignoring the problems and needs of female alcoholics. An important topic for future research is an investigation of the characteristics of female alcoholics who do and do not benefit from long-term residential treatment. Because of the underrepresentation of females in alcoholism treatment program populations, such a study would have to be based on data collected over an extended period of time, in order to amass a substantial sample size.

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APPENDIX

INDIVIDUAL FOLLOW-UP AND AFTERCARE FORM - INDEPENDENCE HOUSE

Participant's Name _____

Date of Termination _____ Length in Program _____

1. Alcohol Data:

a) Have you consumed alcohol since leaving the program? Yes No
b) Are you presently using alcohol (within last week)? Yes No
c) How long were you abstinent after leaving program? _____
d) How many "drinking slips" have you had in the last 30 days?
_____
e) What is the longest period of sobriety since leaving the program?
_____
f) Are you presently taking antabuse? _____

2. Living Situation:

a) I presently live with - self, family, friend, _____(other)
b) Type of living arrangement? apartment - room - house -
_____ (other)

3. Job Status:

a) Are you presently employed - Yes No
b) Present job - (describe) _____
c) Hours per week? _____
d) How long held this particular job? _____
e) Number of jobs since leaving program? _____

4. Program Contact:

a) Have you been involved in any inpatient or outpatient programs since leaving Independence House - Yes No
(List and describe length of stay)
_____
_____
b) Are you participating in A.A. Yes No
How often per week? _____
c) Any legal difficulties since discharge? Yes No
(describe) _____

5. Are you in need of any particular services at the present time?

VITA

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Born February 4, 1952 Married Excellent Health

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EDUCATION:

1970 to 1974 Attended University of Virginia, Charlottesville, Virginia. Earned Bachelor of Arts with Distinction, with major in Psychology, May, 1974. Dean's list.

1975 to present Enrolled in graduate program in Professional Scientific Psychology (a combination of clinical, counseling, and school psychology) at Utah State University, Logan, Utah. This program is approved by the American Psychological Association. Program included supervised practica in outpatient individual and family psychotherapy, behavior modification, and diagnosis. Academic year of 1975-1976: awarded University Research Fellowship. Held graduate assistantships academic years 1976-1977 and 1977-1978 (see "work experience"). Received M.S. degree June, 1978. Thesis title: "Influence of Clinicians' and Clients' Religion on Diagnosis of Mental Illness". Expected date of doctoral degree: June, 1982.

WORK EXPERIENCE:

Sept., 1979 to present	Psychologist I at Gowanda Psychiatric Center, Helmuth, New York, promoted to Psychologist II February, 1981. Served as staff psychologist in heterogeneous adult inpatient psychiatric unit, psychologist in male intake and admissions unit, coordinator of centralized group psychotherapy program. Individual, group, marital, and family psychotherapy, individualized behavior modification, diagnostic interviewing, psychological testing, coordination of and participation in interdisciplinary team meetings, treatment planning, planning and coordinating undergraduate psychology internship program, performance evaluation study, proposal of secure care program, clinical and administrative supervision of staff.
Sept., 1978 to Aug., 1979	APA-approved internship in clinical psychology at Norristown State Hospital, Norristown, Pennsylvania. Supervised experiences included individual and group psychotherapy, individual and ward-wide behavior modification, diagnostic interviewing and testing, supervision of undergraduate volunteer companions, participation in ward conferences and dispositional and teaching staffings, seminars. Major ward assignment on long-term intensive alcoholism treatment unit. Minor ward assignment on rehabilitation and departure unit for schizophrenics and retarded patients.
Sept., 1977 to Aug., 1978	Graduate research assistant for Glendon C. Casto, Ph.D. at Exceptional Child Center, Utah State University, Logan, Utah. Data collection and collaboration for evaluation research regarding curricula for handicapped preschool children, presentations at training workshop for same, consultation regarding research design, writing sections of manuscript of popular-type book on child development.
Sept., 1976 to June, 1977	Graduate teaching assistant for undergraduate Educational Psychology course at Utah State University, under supervision of Elwin C. Nielsen, Ph.D. Grading tests and papers, individual consultations with students, classroom lecturing and leading discussions, preparation of annotated bibliography for supervisor.
April, 1976 to June, 1976	Tutored undergraduate minority group student in Introductory Psychology.

Sept., 1974 to Aug., 1975	Hospital Attendant B at Children's Rehabilitation Center of the University of Virginia Hospital, Charlottesville, Virginia. Physical care of physically, mentally, and/or emotionally handicapped children and adolescents, informal counseling, patient advocacy, recreational activities, implementation of behavior modification programs.
Summers 1968 through 1973	Bank teller, file clerk, and messenger for Maplewood Bank and Trust Co., Maplewood, New Jersey.

EARLY BACKGROUND:

Born and raised in Maplewood, New Jersey. Only child. Father is retired; was Assistant General Manager of automotive dealership. Mother is retired; was medical secretary for neurosurgeon and payroll clerk for Township of Maplewood. Attended local public schools from kindergarten through 12th grade, and graduated from Columbia High School, Maplewood, New Jersey, in June, 1970. Editor on school newspaper, member of school orchestra, received National Merit Scholarship Letter of Commendation.

PUBLICATIONS:

Wadsworth, R. D., & Checketts, K. T. Influence of religious affiliation on psychodiagnosis. Journal of Consulting and Clinical Psychology, 1980, 48(2), 234-240.

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